Solutions.
People.
Energy.℠

SPE Summit: AI – The Next Evolution of DDAA

9 – 10 June 2026| KUALA LUMPUR, MALAYSIA

Digital Contract One-Stop Center (DC OSC) Automating Contract Data Governance for Operations

Ts. Adam Daniel Effendi
AEM Energy Solutions

Muhd Amran Mat Aroh
AEM Energy Solutions





Solutions.
People.
Energy.℠

Session Agenda

1. **The Problem** - Contract Management at Scale
2. **Introduction to DC OSC** - Architecture & Approach
3. **The Key Innovation** - Governance as Data
4. **Results** - What the Numbers Tell Us
5. **Lessons From the Field & Practical Takeaways**
6. **Opportunity from Data Automation & Governance**
7. **Integration with AI for Decision Making**

The Problem – Contract Management at Scale

1

2

3

The Problem – Contract Management at Scale

1

Fragmented Systems & Data Chaos

Contract tasks scattered across client source systems, Excel files, and personal folders with non-standard naming conventions and storage formats, creating confusion and delays

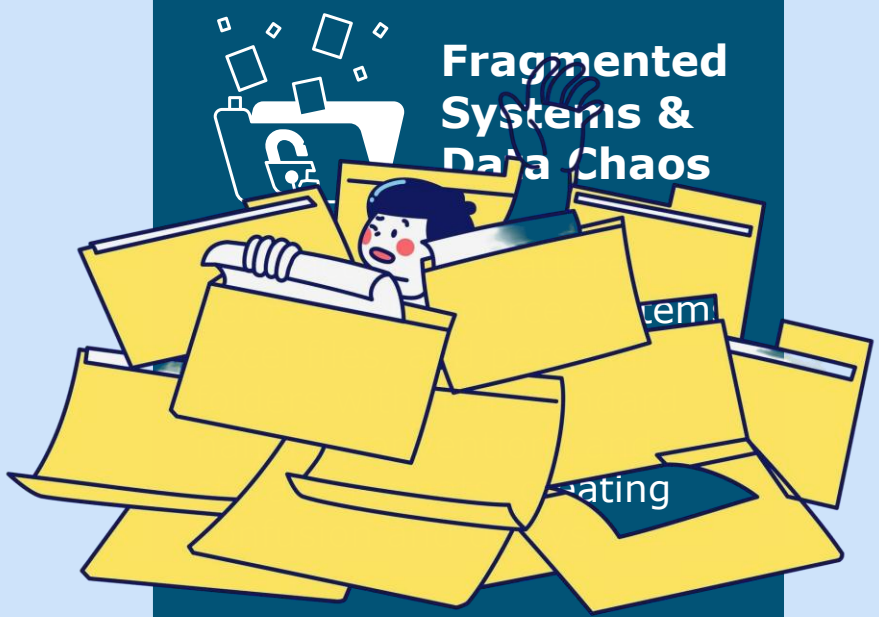


2

3

The Problem – Contract Management at Scale

1



Fragmented Systems & Data Chaos

2

Manual & Error-Prone Processes

Engineers spend hours manually cross-referencing across **80+ contract types** and **20,000+ contract line items**, increasing risk of human error and inefficiency



3

The Problem – Contract Management at Scale



3

Limited Visibility & Control

No centralized view of contract status and ACV utilization, making it difficult to track performance and make informed decisions

1

Introduction to DC OSC - Architecture & Approach



CENTRALIZE & AUTOMATE

Unify fragmented manual processes into a single digital platform that automates contract workflows, cutting processing time from hours to minutes



STANDARDIZE & INTEGRATE

Establish a single source of truth with standardized data formats and seamless integration across all contract lifecycle stages, governed by unidirectional data-flow principles



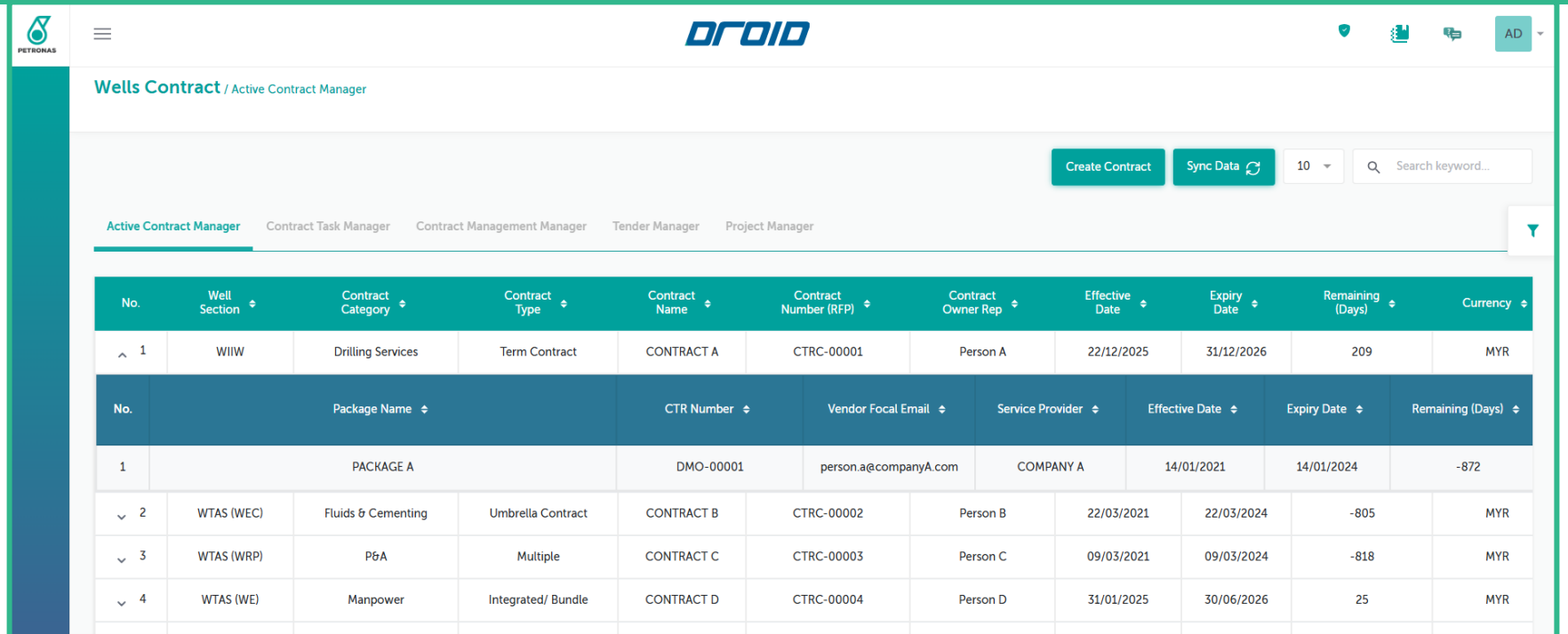
ENABLE & EMPOWER

Deliver real-time visibility through dashboards and self-service tools, empowering stakeholders with instant access to contract insights for faster, data-driven decisions

Introduction to DC OSC - Architecture & Approach

CENTRALIZE & AUTOMATE

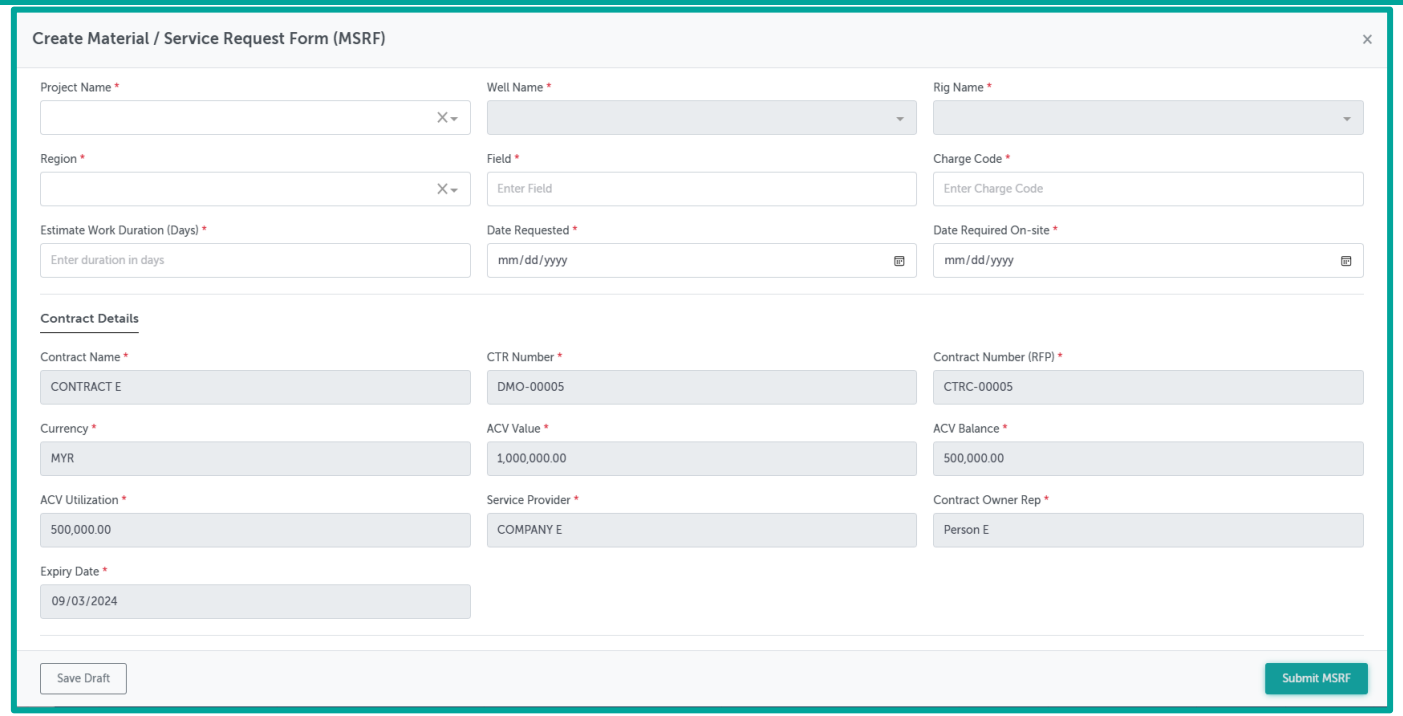
Unify fragmented manual processes into a single digital platform that automates contract workflows, cutting processing time from hours to minutes



Introduction to DC OSC - Architecture & Approach

STANDARDIZE & INTEGRATE

Establish a single source of truth with standardized data formats and seamless integration across all contract lifecycle stages, governed by unidirectional data-flow principles

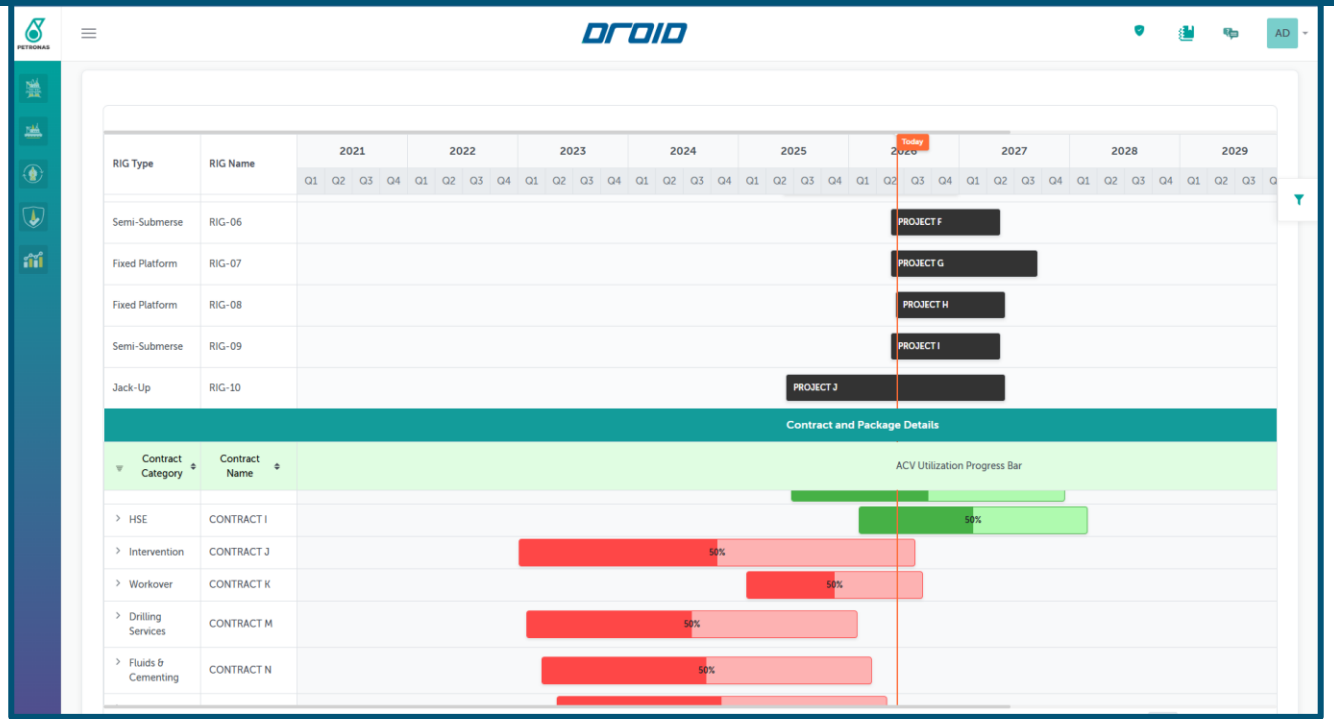


Introduction to DC OSC - Architecture & Approach



ENABLE & EMPOWER

Deliver real-time visibility through dashboards and self-service tools, empowering stakeholders with instant access to contract insights for faster, data-driven decisions



Governance as Data – In Practice

APPLICATION

DEMONSTRATION

"Making Automation Works with Data Foundation"

Data IS the Automation Foundation

Why governance rules come before code — the principle behind the DC OSC results

✗ WITHOUT DATA FOUNDATION

Real failure modes we found in the data:

- Item No. field stored descriptions instead of numbers:

"(Insulated -50°C to 200°C) - up to 10m²"
...should be number format [XXX-XXXX]

- ACV Balance went negative — utilization exceeded allocated value.
- Critical fields empty — missing Service Provider, missing Expiry Date.
- Zeros across all financial fields — null vs intentional indistinguishable.

Automation rule:

```
if utilization > 90% then alert
```

Result: FAILS — can't reason against data that contradicts itself or doesn't exist

✓ WITH DATA FOUNDATION (DC OSC)

DC OSC enforces at ingestion:

- Format validation — Item No. accepted only if [XXX-XXXX] number format.
- ACV Balance auto-calculated; negative balances flagged for review, not stored silently.
- Required fields rejected if empty — incomplete records cannot enter the system.
- Zero distinguished from null — intentional vs missing data is preserved.

Same automation rule:

```
if utilization > 90% then alert
```

Result: WORKS reliably — data is trustworthy, rules are config not code

"Automation is the visible 5%. The 95% beneath it is data design. Skip the foundation — automation fails in production."

Results - What the Numbers Tell Us

Measured outcomes from DC OSC across its stages — the current web-based application extends these gains.

1

~80%

2

5%

3

5%

Results - What the Numbers Tell Us

Measured outcomes from DC OSC across its stages — the current web-based application extends these gains.

1

~80%

REDUCTION IN CONTRACT MANAGEMENT EFFORT

Equivalent to several FTEs of engineering capacity redirected from manual contract tasks to higher-value work.

Industry Benchmark
Companies that have automated their contract work typically see 30–60% effort reduction. Only about 1 in 4 companies have actually done it — most still operate manually.

2

5%

3

5%

Results - What the Numbers Tell Us

Measured outcomes from DC OSC across its stages — the current web-based application extends these gains.

1

~80%

REDUCTION IN CONTRACT MANAGEMENT EFFORT

Equivalent to several FTEs of engineering capacity redirected from manual contract tasks to higher-value work.

Industry Benchmark
Companies that have automated their contract work typically see 30–60% effort reduction. Only about 1 in 4 companies have actually done it — most still operate manually.

2

5%

REDUCTION IN COST ESTIMATE VARIANCE

Automated cross-checks against centralized contract data eliminate manual reconciliation errors.

Industry Practice
Industry cost-engineering standards accept a 10–20% gap between estimated and actual contract costs when tracked manually. Trimming this by 5 % across a 20,000+ line-item portfolio is meaningful cost certainty.

3

5%

Results - What the Numbers Tell Us

Measured outcomes from DC OSC across its stages — the current web-based application extends these gains.

1

~80%

REDUCTION IN CONTRACT MANAGEMENT EFFORT

Equivalent to several FTEs of engineering capacity redirected from manual contract tasks to higher-value work.

Industry Benchmark
Companies that have automated their contract work typically see 30–60% effort reduction. Only about 1 in 4 companies have actually done it — most still operate manually.

2

5%

REDUCTION IN COST ESTIMATE VARIANCE

Automated cross-checks against centralized contract data eliminate manual reconciliation errors.

Industry Practice
Industry cost-engineering standards accept a 10–20% gap between estimated and actual contract costs when tracked manually. Trimming this by 5 points across a 20,000+ line-item portfolio is meaningful cost certainty.

3

5%

REDUCTION IN ANNUAL VALUE LEAKAGE

Standardized ingestion and governance-as-data eliminate duplicate spend and uncaptured ACV utilization.

Industry Practice
Across 750+ companies surveyed, about 9% of contract value is lost to leakage each year. Industry analysts estimate 2–5% is recoverable through better contract systems — this delivery is at the top of that range.

Sources: World Commerce & Contracting 2023 Benchmark (n=750+) | AACE RP 87R-14 Cost Estimate Classification (Petroleum E&P) | Independent Project Analysis (Merrow, SPE-153695, n=20,000+) | McKinsey Contract Lifecycle Management Benchmark

Lessons From the Field & Practical Takeaways

1

Standardize Data BEFORE You Automate

Why it matters:

Automation amplifies whatever it inherits.
Automating messy data scales the mess faster.

Try this:

Audit data quality and standardization gaps BEFORE scoping your next automation project.

Get the data foundation right, the automation will work

Lessons From the Field & Practical Takeaways

1

Standardize Data BEFORE You Automate

Why it matters:

Automation amplifies whatever it inherits.
Automating messy data scales the mess faster.

Try this:

Audit data quality and standardization gaps BEFORE scoping your next automation project.

Get the data foundation right, the automation will work

Opportunity from Data Automation & Governance

1

ARCHITECTURE & GOVERNANCE
Foundation

- **Centralized Data Platform**

  Single source of truth unifying fragmented systems
- **Standardized Across Types**

  Consistent data structure enabling scalability

2

PROVEN RESULTS
Not Just Incremental Gains

- **Reduced Management Effort**

  Hours to minutes on contract processing
- **Cost Estimate Accuracy**

  Significant discrepancy reduction vs. industry
- **Value Leakage Minimized**

  Clean data directly cuts annual revenue loss

3

AI-READY OPPORTUNITY
The Real Unlock

- **Clean Data Enables AI**

  Structured, governed data is the prerequisite for robust AI integration
- **AI-Powered Contract Intelligence**

  Automated summaries, proactive alerts & best-contract recommendations
- **Reactive → Proactive**

  From manual contract management to AI-driven decision making

"Proper architecture doesn't just improve results — it opens the door to capabilities that weren't possible before."

Integration with AI for Decision Making

ACM Contract Data
Centralized source of truth for all contract records

SMART FILTER
AI Assisted Filter Function

DATA FUNNEL
Contract Category | Contract Type | Well Section

AI Analysis

Contract Owner (ACM)

AI-Summarized Contract Portfolio

- View all contracts or filter by category, type, and well section
- Proactive action items surfaced automatically

Example Actions:

- *Contract expired – needs extension*
- *ACV nearly fully utilized – consider increase*

PMT User

AI-Recommended Best Contract

- Same ACM data, tailored for contract workflow tasks
- Filter by category, type, and well section
- AI selects the best available contract based on utilization, status, and fit

Outcome:

- *Faster, data-driven contract selection for workflows*

Digital Contract One-Stop Center (DC OSC)
Automating Contract Data Governance for Operations

Q&A

AEM ENERSOL
Advanced Engineering & Management for Energy Solutions