AVEVA value chain optimization

How AVEVA’s agile solutions bring value in a volatile environment

Freddy Garces - Director of Product Management, Value Chain Optimization
David Moody - Senior Product Manager, Unified Supply Chain
Downstream O&G value chain

Real workflows: legacy of point solutions

- Trader tool
- Planning tool
- Scheduling tool
- Operations tool(s)
- Production accounting tool
- Management reporting tool
- Reactor modeling tool
- Offsites tool
- Real-time optimization tool
- Utilities optimization tool
- Feedstock management tool
- Multi-site networking tool

Manual data transfer or custom codes and support

Value leaks and lost opportunities:
- Low transparency
- Low consistency
- High tool dependency
- Lack of agility
- Low accuracy
- High maintenance

© 2023 AVEVA Group Limited and its subsidiaries. All rights reserved.
Value chain optimization vision

Enable enterprise collaboration and agility to maximize profitability across the value chain

After operation

Current time

1–15 days

1–3 months

One year

2–10 years

Operations analytics

Actuals

Operation targets

Operation plan

Fiscal targets

Strategic decisions

Performance

Operations

Scheduling

Operational planning

Medium-term business planning

Long-term business planning

Production accounting

Process optimization and reactor models

Logistics

Supply and distribution planning

Budget planning

Planning model tracking/update

Energy management

Daily scheduling

Production planning

Crude management

Operating planning

Quality analysis

Prescriptive performance (plan vs. actual)

Monitoring & control

Fiscal targets

Strategic decisions

Operations analytics

Actuals

Operation targets

Operation plan

Fiscal targets

Strategic decisions

Performance

Operations

Scheduling

Operational planning

Medium-term business planning

Long-term business planning

Production accounting

Process optimization and reactor models

Logistics

Supply and distribution planning

Budget planning

Planning model tracking/update

Energy management

Daily scheduling

Production planning

Crude management

Prescriptive performance (plan vs. actual)

Monitoring & control

Fiscal targets

Strategic decisions

Operations analytics

Actuals

Operation targets

Operation plan

Fiscal targets

Strategic decisions

Performance

Operations

Scheduling

Operational planning

Medium-term business planning

Long-term business planning

Production accounting

Process optimization and reactor models

Logistics

Supply and distribution planning

Budget planning

Planning model tracking/update

Energy management

Daily scheduling

Production planning

Crude management

Prescriptive performance (plan vs. actual)

Monitoring & control

Fiscal targets

Strategic decisions

Operations analytics

Actuals

Operation targets

Operation plan

Fiscal targets

Strategic decisions

Performance

Operations

Scheduling

Operational planning

Medium-term business planning

Long-term business planning

Production accounting

Process optimization and reactor models

Logistics

Supply and distribution planning

Budget planning

Planning model tracking/update

Energy management

Daily scheduling

Production planning

Crude management

Prescriptive performance (plan vs. actual)

Monitoring & control

Fiscal targets

Strategic decisions

Operations analytics

Actuals

Operation targets

Operation plan

Fiscal targets

Strategic decisions

Performance

Operations

Scheduling

Operational planning

Medium-term business planning

Long-term business planning

Production accounting

Process optimization and reactor models

Logistics

Supply and distribution planning

Budget planning

Planning model tracking/update

Energy management

Daily scheduling

Production planning

Crude management

Prescriptive performance (plan vs. actual)

Monitoring & control

Fiscal targets

Strategic decisions

Operations analytics

Actuals

Operation targets

Operation plan

Fiscal targets

Strategic decisions

Performance

Operations

Scheduling

Operational planning

Medium-term business planning

Long-term business planning

Production accounting

Process optimization and reactor models

Logistics

Supply and distribution planning

Budget planning

Planning model tracking/update

Energy management

Daily scheduling

Production planning

Crude management

Prescriptive performance (plan vs. actual)

Monitoring & control

Fiscal targets

Strategic decisions

Operations analytics

Actuals

Operation targets

Operation plan

Fiscal targets

Strategic decisions

Performance

Operations

Scheduling

Operational planning

Medium-term business planning

Long-term business planning

Production accounting

Process optimization and reactor models

Logistics

Supply and distribution planning

Budget planning

Planning model tracking/update

Energy management

Daily scheduling

Production planning

Crude management

Prescriptive performance (plan vs. actual)

Monitoring & control

Fiscal targets

Strategic decisions

Operations analytics

Actuals

Operation targets

Operation plan

Fiscal targets

Strategic decisions

Performance

Operations

Scheduling

Operational planning

Medium-term business planning

Long-term business planning

Production accounting

Process optimization and reactor models

Logistics

Supply and distribution planning

Budget planning

Planning model tracking/update

Energy management

Daily scheduling

Production planning

Crude management

Prescriptive performance (plan vs. actual)

Monitoring & control

Fiscal targets

Strategic decisions

Operations analytics

Actuals

Operation targets

Operation plan

Fiscal targets

Strategic decisions

Performance

Operations

Scheduling

Operational planning

Medium-term business planning

Long-term business planning

Production accounting

Process optimization and reactor models

Logistics

Supply and distribution planning

Budget planning

Planning model tracking/update

Energy management

Daily scheduling

Production planning

Crude management

Prescriptive performance (plan vs. actual)

Monitoring & control

Fiscal targets

Strategic decisions

Operations analytics

Actuals

Operation targets

Operation plan

Fiscal targets

Strategic decisions

Performance

Operations

Scheduling

Operational planning

Medium-term business planning

Long-term business planning

Production accounting

Process optimization and reactor models

Logistics

Supply and distribution planning

Budget planning

Planning model tracking/update

Energy management

Daily scheduling

Production planning

Crude management

Prescriptive performance (plan vs. actual)

Monitoring & control

Fiscal targets

Strategic decisions
Refining and petrochemical value chain

Abstracted scope

1–15 days

Corporate business plans

Supply and distribution planning

Production planning

Feedstock, inventory, production

Budget planning

Fiscal targets

Logistics

Import, export

1–3 months

Operation plan

Operation intelligence

Operations scheduling

Actual

Production accounting

Results

Quality information

Lab analysis

Feedstock management

Offsite management

Advanced process control

Energy management

Operation optimization (RTO)

Operations

Operation targets

Results

Performance monitoring

(plan vs. actual)

Planning model tracking/update

Current Time

2–10 years

Strategic plan

Investment planning

Digital twin (supply chain)
Reactor models roadmap in AVEVA Process Optimization

- Neural network model
- Electrolyzer model
- Fractionation column enhancements
- FCC dual riser enhancement
- HDP enhancement Part 2
- Aromatics reactor models
- FCC C4 cracking kinetics
- HDP for vegetable oils
- Hybrid models
- Improvement for LP

2022
ROMe 2019SP2

2023

2024
APO 2023

2025
APO 2024

2026
APO 2025

© 2023 AVEVA Group plc and its subsidiaries. All rights reserved.
AVEVA Production Accounting roadmap

**APA 2022 R2 release**
Self service analytics & dashboards,
AI enabled feature,
Enhanced reporting capabilities

**APA 2022 release**
Cloud release (SaaS)

**APA 2023 release**
Emission monitoring & reporting
Thermo Integration,
Dashboard enhancement
AVEVA Data Hub integration

- Full release

Thermo integration enhancements,
AVEVA Data Hub integration enhancements
Web reporting
Web enabled GUI

Advance GUI capabilities,
APA – PRO-II integration,
APA – USC Plan integration

2022 2023 2024 2025 2026
AVEVA™ Unified Supply Chain

Agility in volatility
Volatility is increasing – agility is critical

- Pricing volatility
- Demand volatility
- Sustainability and energy transition
- Feedstock availability
- Feedstock quality
- Regulatory

10-year WTI trend $/bbl

© 2023 AVEVA Group Limited and its subsidiaries. All rights reserved.
Digital agility forges digital resilience

"Oil and gas companies and their suppliers need to have capabilities in place to enable greater resiliency and adaptability as they face disruptive market environments."

-IDC Report
Complexity drives increasing value chain scope

Traditional planning manufacturing plant focus

Enterprise optimization end-to-end value chain

Requirements: A *unified* supply chain platform to enable end-to-end optimization
Unified Supply Chain is designed for agile planning

- No code platform
  Quick to learn and upskill

- Easier model maintenance, updating and improving

- Leverage cloud computing to increase analysis scale

- Unified - simplify dataflows and reduce silos
## Unified Supply Chain priorities & roadmap

<table>
<thead>
<tr>
<th>AVEVA Unified Supply Chain</th>
<th>USC platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSAY + Real Time Crude</td>
<td>Cybersecurity excellence</td>
</tr>
<tr>
<td>Crude &amp; feedstock modelling and knowledge management</td>
<td>Enhanced integration &amp; reporting</td>
</tr>
<tr>
<td>PLAN</td>
<td>AVEVA SaaS hosted USC</td>
</tr>
<tr>
<td>Plant optimization with integrated analytics</td>
<td></td>
</tr>
<tr>
<td>NETWORK</td>
<td></td>
</tr>
<tr>
<td>Supply &amp; distribution network optimisation</td>
<td></td>
</tr>
<tr>
<td>SCHEDULE + Schedule AI Assistant</td>
<td></td>
</tr>
<tr>
<td>Plant scheduling including feed and blend optimisation</td>
<td></td>
</tr>
<tr>
<td>CALCULATION HUB</td>
<td></td>
</tr>
<tr>
<td>Scalable high-performance cloud computing</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Features</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assay libraries</td>
<td>Bio-assay libraries</td>
</tr>
<tr>
<td>Web Services</td>
<td>Cargo Tracking</td>
</tr>
<tr>
<td><strong>Plan</strong></td>
<td><strong>Functions</strong></td>
</tr>
<tr>
<td>Process modelling</td>
<td>Gas phase handling</td>
</tr>
<tr>
<td>Web Services</td>
<td>Data I/O</td>
</tr>
<tr>
<td>Reporting</td>
<td></td>
</tr>
<tr>
<td>Schedule</td>
<td><strong>Schedule AI</strong></td>
</tr>
<tr>
<td>Upgrade simulator</td>
<td>Crude scheduling</td>
</tr>
<tr>
<td>Scalability</td>
<td><strong>Improved scaling</strong></td>
</tr>
<tr>
<td></td>
<td><strong>WebsServices</strong></td>
</tr>
</tbody>
</table>
Where our users find value

- **Pricing volatility**
  - Demand volatility

  High-performance computing for complex scenario analysis ahead of the market

- **Supply chain disruption**

  Replan and evaluate response to unplanned reliability or shipment delays

- **Regulatory**

  Adapt site planning models to changing legislation and site configuration

- **Feedstock availability**
  - Feedstock quality

  Rapidly workup new feedstock assays and assess for compatibility and suitability

- **Real-time crude**

  Calculation hub

- **Renewables & CO₂ costs optimization**

  Sustainability and energy transition

  for master planning and sustainable operations

- **Network**

  Schedule AI

  Replan and evaluate response to unplanned reliability or shipment delays

- **Plan**

  Adapt site planning models to changing legislation and site configuration
BP – oil and gas downstream

Business revolution with AVEVA’s solution in the cloud

• Goals
  • Simplify and standardize oil and gas downstream supply-chain management
  • Enhance data management and transparency to improve decision-making
  • Reduce IT cost of ownership and increase agility

• Challenges
  • Lack of transparency and duplication of efforts across the supply chain
  • Inability to make quick decisions that could benefit the business
  • Disconnected processes and tools — multiple local planning solutions

• Results
  • Significant margin improvements through an improved refinery optimization process
  • More robust and lower risk plans — ability to run complex models that weren’t possible before
  • Earlier decisions and communications on feedstock purchasing and planning operations
  • Standardization of data and better transparency: all teams and different sites are using the most up-to-date information, sharing best practices for modelling, analyses, and business processes
  • BP is no longer limited by technology, but rather empowered by it

If you could do in minutes what previously took a day, what would you do?
AVEVA’s technology in the cloud is creating time, and BP’s responsibility is what to do with the time saved. This is revolutionary to our business.”
Claire Dickson, CIO of Downstream

Earlier decisions
2 days → 2 hours
on planning and crude purchase

Improved calculation speed
7 hours → 3 min
to run planning model

Transparency and collaboration
Instant sharing
of plans across enterprise

© 2023 AVEVA Group Limited and its subsidiaries. All rights reserved.

View complete story on AVEVA’s website
ADNOC – Multiple companies on one enterprise platform to achieve max profit

Smarter and faster decision-making through digital command centre

• Challenges
  • Long cycle to produce production plans, inconsistency in reporting, location performance and discrepancy in transfer measurement between plants
  • Reduce “value leaks” and improve enterprise visibility on operations, equipment, energy usage, and production information

• Solution
  • Panorama Digital Command Center: single source of accurate information across ADNOC’s value chain, powered by AVEVA leading technology
  • Spiral Unified Supply Chain Management model of all ADNOC subsidiaries to enable enterprise optimization across the entire value chain
  • Feedstock characterization, production planning with integrated analytics and supply and distribution network optimization

• Results
  • Panorama provides access information from one central location, enabling a “single version of the truth” via dashboards viewable from Pods and the 150ft x 10ft video wall centerpiece
  • Enterprise value chain optimization enabling collaboration and agile strategic decision making
  • $60-100M benefits in optimization in a single run of the integrated production planning model

Source:
AVEVA’s Unified Event 2018 Presentation / ADNOC customer success story on AVEVA’s website

© 2023 AVEVA Group Limited and its subsidiaries. All rights reserved.
Sustainable supply chain optimization in the cloud

Increased operational efficiency and enterprise agility

Quicker decision making based on unified supply chain system

Production automatically optimized using digital models infused with smart analytics
Optimize your value chain to capture market opportunities

Unified system to enable enterprise agility and collaboration across supply chain and operations

**Roadmap:** Enable sustainable supply chain, enhanced cloud experience and AI infusion (scheduling), industry diversification (gas and chemicals), sustainability and energy minimization (optimization)
Effective economic optimization of hydrocarbon value chain can boost profitability by $50–300M per year for a typical oil refinery.

AVEVA’s business value

Value chain optimization

- Business process improvement
- Break down silos
- Better decision making
- Increase revenue and margin

While helping to achieve sustainability objectives.
Freddy Garces
Director of Product Management – Value Chain Optimization
• AVEVA
  • freddy.garces@aveva.com

David Moody
Senior Product Manager – Unified Supply Chain
• AVEVA
  • david.moody@aveva.com
Questions?
Please wait for the microphone.
State your name and company.

Please remember to...
Navigate to this session in the mobile app to complete the survey.

Thank you!
This presentation may include predictions, estimates, intentions, beliefs and other statements that are or may be construed as being forward-looking. While these forward-looking statements represent our current judgment on what the future holds, they are subject to risks and uncertainties that could result in actual outcomes differing materially from those projected in these statements. No statement contained herein constitutes a commitment by AVEVA to perform any particular action or to deliver any particular product or product features. Readers are cautioned not to place undue reliance on these forward-looking statements, which reflect our opinions only as of the date of this presentation.

The Company shall not be obliged to disclose any revision to these forward-looking statements to reflect events or circumstances occurring after the date on which they are made or to reflect the occurrence of future events.
ABOUT AVEVA

AVEVA is a world leader in industrial software, providing engineering and operational solutions across multiple industries, including oil and gas, chemical, pharmaceutical, power and utilities, marine, renewables, and food and beverage. Our agnostic and open architecture helps organizations design, build, operate, maintain and optimize the complete lifecycle of complex industrial assets, from production plants and offshore platforms to manufactured consumer goods.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life’s essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world’s most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

Learn more at www.aveva.com