Get more of your data with AVEVA™
Advanced Analytics

Christian-Marc Pouyez
50% of all industrial data was created in the last 2 years. In 2024, that will still be true.

Source: Statista, Sept 2022
38% of new operational data will be stored and processed in the cloud. This is an increase of 16% since just two years ago.

Artificial Intelligence (AI) Market Acceleration

$17.2 Billion

The market for AI in manufacturing alone is projected to grow by nearly 50% per year, to hit $17.2 billion by 2025.¹

430%

IDC predicts that global data usage will vastly increase from 33 zettabytes in 2018 to 175 zettabytes by 2025 – an increase of 430%.²

Sources: 1. Markets & Markets 2. Statista
80%

Data scientists spend most of their time to gathering, cleaning, and preparing data.

Source: Analytics Insight, Sept 2022
Industry & market pressures

$3.7 T
Industry 4.0 for operations
The value created by the potential of manufacturers and suppliers implementing Industry 4.0 in their operations is estimated at 3.7 trillion USD in 2025.¹

$280 B
Investments in digital twin
The application of digital twin technology is to play a pivotal role in future urban planning, construction and operations as it is expected to save the sector some $280bn by 2030.²

70%
Digital improvement potential
70% of surveyed companies remain at the level of individual use cases and have not been able to impact at scale from their digital program.³

82%
Asset performance optimization
82% of asset failures are Random.⁴

Sources: ¹ McKinsey ² Investment Monitor ³ BCG ⁴ Processing Magazine
Required capabilities

- **Increase productivity**
  - Equipment optimization
  - Production management
    - “Increased production by 33%. Decreased downtime by more than 50%”

- **Improve quality & compliance**
  - Production execution
  - Compliance
    - “Product consistency, quality and delivery improved by 125%.”

- **Minimize environmental footprint**
  - Energy management
    - “9% reduction of energy usage.”
  - Transparency and traceability
  - “Improved waste reduction.”

- **Waste and losses reduction**
  - Increase asset performance
  - Reduce operational and environmental risk
Introducing: AVEVA Advanced Analytics

Advanced Analytics

**Predictive Quality**
- Run CpK
- First Pass Quality %

**Predictive Throughput**
- Production Rate
- Run Length
- Cycle Time
- Material Cost/Unit Production

**Predictive Energy Efficiency**
- Energy Cost
- Unit Production

Solve quality problems before they happen
Maximize production with proactive real-time recommendations
Operate at the sweet spot of production and energy consumption

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Comprehensive platform drives innovation

Combine your existing data with AI-enabled applications for faster and smarter decisions

**PERVASIVE CONNECTIVITY with Data Hub**

- Connect to PI Server, AVEVA Historian, any PLC, DCS, SCADA, Historian, Database, or Cloud Platform
- Data Hub is system of record for Advanced Analytics – direct read/write data in/out of Data Hub

**DIGITAL TWIN – Linked to AF and ADH Assets**

- Create a complete virtual picture of your operations - past, present, and future
- Reuse your ADH Assets and PI AF models
- Calculations
  - First Principal Models
  - Machine Learning Models
  - Alerts & Recommendations

**“AI” ENABLED APPLICATIONS**

- Solve top productivity challenges “out of the box” driven by simple wizards – no code required
  - Quality Throughput
  - Energy Efficiency
  - Digital Services
  - Can also incorporate models created by data scientists

**SCALE EFFORTLESSLY**

- Create “Classes” that can apply calculations and models to tens, hundreds, or thousands of assets or processes
  - Integrated with ADH Community data sharing for applying models to Digital Services customers
Digital Twin

Visibility into all aspects of industrial assets and operations

- Classes for scaling twins
- Parent-children hierarchy
  - Site, Plant, Department, Line, Machine
- Linked Sensors for receiving data
- Timeline of key twin properties
- Visual Dashboard with key information
- Opportunities - possible issues to be addressed

 Provides the structure and context to automate insights across all assets, production lines, and plants
Digital threads

Logical workflow to support operations

• No-code logical workflows
• Automate calculations
• Operationalize actions
• Trigger specific actions or activities
• Sending notification via email/SMS
• Automatically and continuously running

The actions represented by a digital thread could trigger specific actions or activities
Model factory

Templates to solve fundamental manufacturing problems

- Use cases templatized model selection
- Automate Machine Learning (ML) model creation
- Easy-guided twin configuration steps - product segmentation, operational state, rate
- Automatically evaluates and selects the best performing algorithm
- Visualized model creation process

A digital assembly line for automating machine learning (ML) model creation and deployment
Intelligent alerts & actions

Notify when condition is abnormal

- Create intelligent alerts
- Create logical workflows
- Automate actions
- Action awareness views
Demo
Watch the TwinThread Intro video to get a 2-minute overview of our system and terminology.
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Advanced Analytics applications

Key application details

Predictive Quality
Predicts a quality parameter
Some use cases:
- There is no quality measurement
- Offline measurement with delayed lab results
- Get an early indication of quality in production line
Application provides:
- Predicted Quality value
- Ideal operating conditions
- Anomaly timeline and breakdown
- Recommendations on controllable parameters

Computes measures of production rate
Some use cases:
- There is no direct measure of production
- Identify optimum operating conditions to maximize production
- Identify measures of production by product or rate
Application provides:
- Predicted production rate
- Ideal operating conditions
- Anomaly timeline and breakdown
- Recommendations on controllable parameters

Predictive Throughput

Predictive Energy Efficiency
Provides normalized measures of energy consumption
Some use cases:
- There is no direct measure of energy
- Normalized measures of energy use by product
- Identify optimum operating conditions to minimize energy consumption
Application provides:
- Normalized energy use
- Predicted total energy consumption
- Ideal operating conditions
- Anomaly timeline and breakdown
- Recommendations on controllable parameters

Some use cases:
- There is no direct measure of energy
- Normalized measures of energy use by product
- Identify optimum operating conditions to minimize energy consumption
Application provides:
- Normalized energy use
- Predicted total energy consumption
- Ideal operating conditions
- Anomaly timeline and breakdown
- Recommendations on controllable parameters
Case study: Predictive quality

**Problem**
Premium Pet Food Manufacturer wanted to reduce scrap from frequent line startups / formulation changes and reduce reliance on in-process testing. Due to 30-60min process lag times between key unit operations and finished product quality tests, the potential for scrap from off-quality product was very high.

**Solution**
Implement predictive models for “middle of line” quality for finished product Density, Moisture, Fat, and Protein content. Monitor more than 75 process variables from across the production process to make accurate predictions for all four quality parameters in real-time, plus provide recommendations to operators to keep quality on-target.

**Payback**
Payback periods between 15-60 days (implementation + 1yr subscription).

**Innovation and Value Streams**
- Top quality drivers
- Best recipe / centerlines
- Automation opportunities
- Recipe simulation
- Soft Sensor / Real-time Prediction
- Real-time Anomalies
- Real-time Recommendations
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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.

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