INDUSTRY SOLUTION

Digital Acceleration in the Chemicals Industry

While leading corporations in the chemicals industry try to seek market and shareholder differentiation in sustained growth and efficiency, this is extremely difficult to accomplish. Current levels of growth are nowhere near historical levels. But even it if were, growth by itself isn't enough – it must be combined with improved asset utilization.

Digital Transformation is one of the core innovations being used by leading chemical corporations to increase asset utilization through higher manufacturing efficiency, including the efficiencies of multi-plant sites and integrated value chains. For larger chemical corporations, a key challenge is accelerating the value; finding and using methods to transform operations faster than the competition.

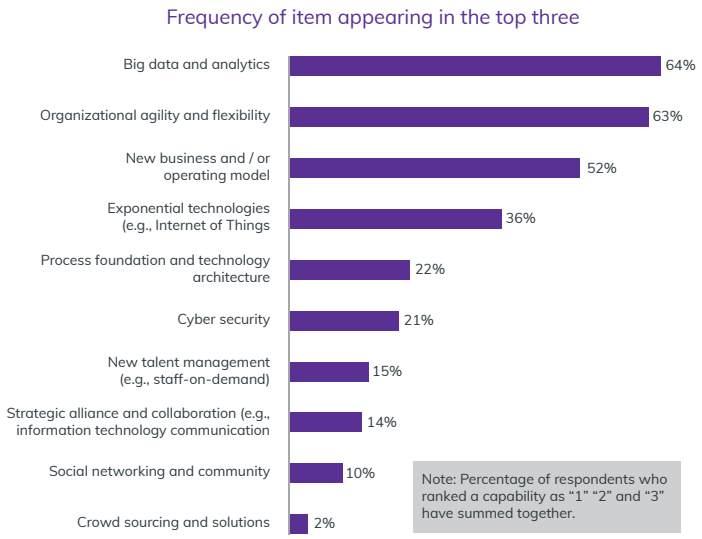
Introduction - Digital Acceleration

Digital Transformation Trends

The digital wave is beginning to significantly impact the chemicals industry. A 2016 PwC study on the Industry 4.0: Building the digital enterprise found that chemical respondents while only 32% reported they are advanced in digital solutions and horizontal value chain integration (transparency across demand and supply planning), they expect to invest 5% of annual revenue in digital solutions to advance these solutions.

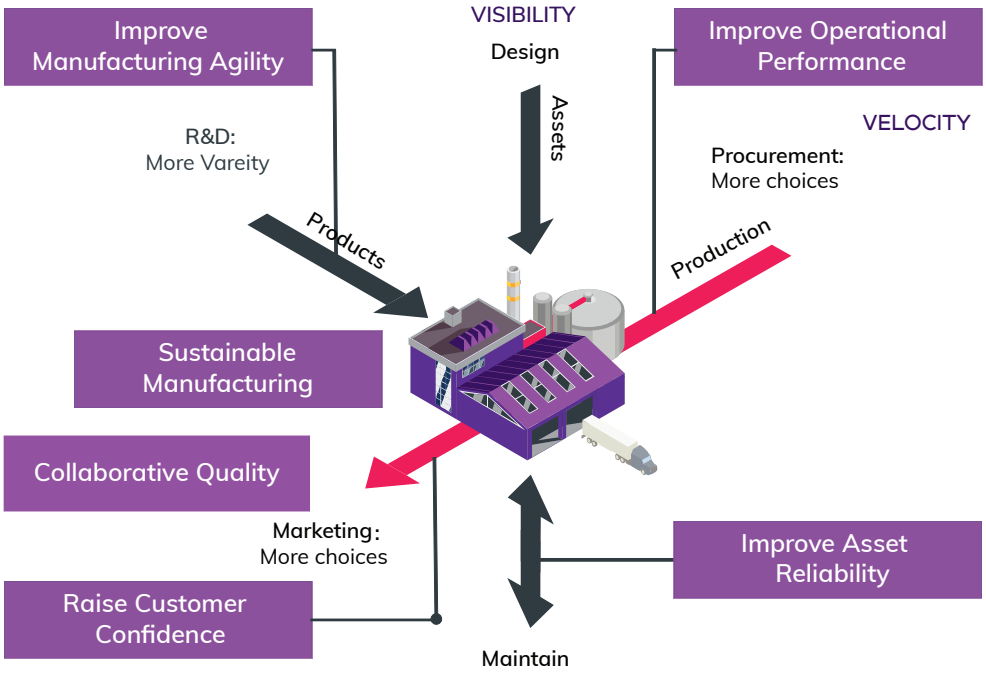
A Deloitte Touche Tohmatsu Limited 2016 Global Digital Chemistry Survey conducted in December 2016 found that Big data and analytics (digital) and Organizational agility and flexibility (transformation) were the top 2 capabilities required to monetize digital initiatives.

Digital Transformation can take years but the value is enormous.



Value Drivers for Digital Acceleration

There are several key value drivers for accelerating digital transformation across the Chemicals industries. Leading chemical corporations are implementing digital transformation faster than others, and as a result, these leaders are disrupting their market segments. Fast and correct information about the chemicals – where it is, how it was made, its chemical properties – becomes more valuable to win and grow business from their key customers. There isn't enough data (yet) on the chemicals industry digital wave, but many analysts believe that lessons learned from other industries are relevant.



The Digital Acceleration Journey

Digital Transformation is a transformation of work, enabled by "digitization". It is helpful to consider the differences between four commonly-used phrases used in the "digital" conversation and reflect where you may be on this journey.

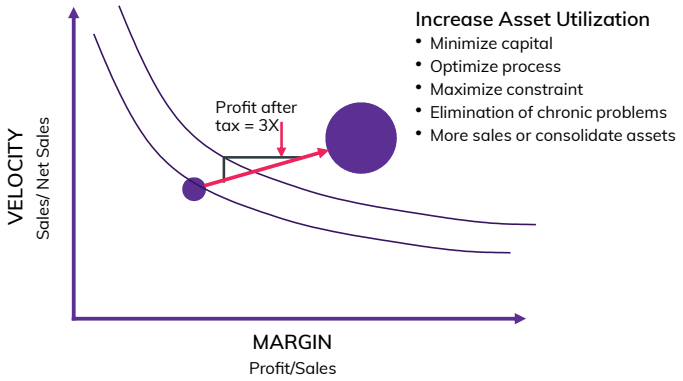
Digitization	Digitalization	Digital Transformation	Digital Acceleration
Conversion of data into digital form. It is essential to first move from document-centric to data-centric information gathering.	Conversion of the digitized data into higher value information, and where feasible, automated improvements.	Transformation of work enabled by digitalization. Digitalization by itself does not produce enough value.	Acceleration of digital transformation

Digital transformation minimizes "wasted work" and changes work in the following ways:

- **Waste**—minimizes "waste", such as, manual calculations, time to find and verify information
- **When**—earlier, often before situations or opportunities arise
- **Where**—includes remote, mobile workers
- **Who**—optimize the experts' participation (so that they can focus on improvements)
- **How**—planned, proactively guided, and tracked teamwork

AVEVA focuses on all components to achieve Digital Project Execution excellence using a holistic approach which empowers all project personnel with the right enabling technologies and training to TRANSFORM WORK.

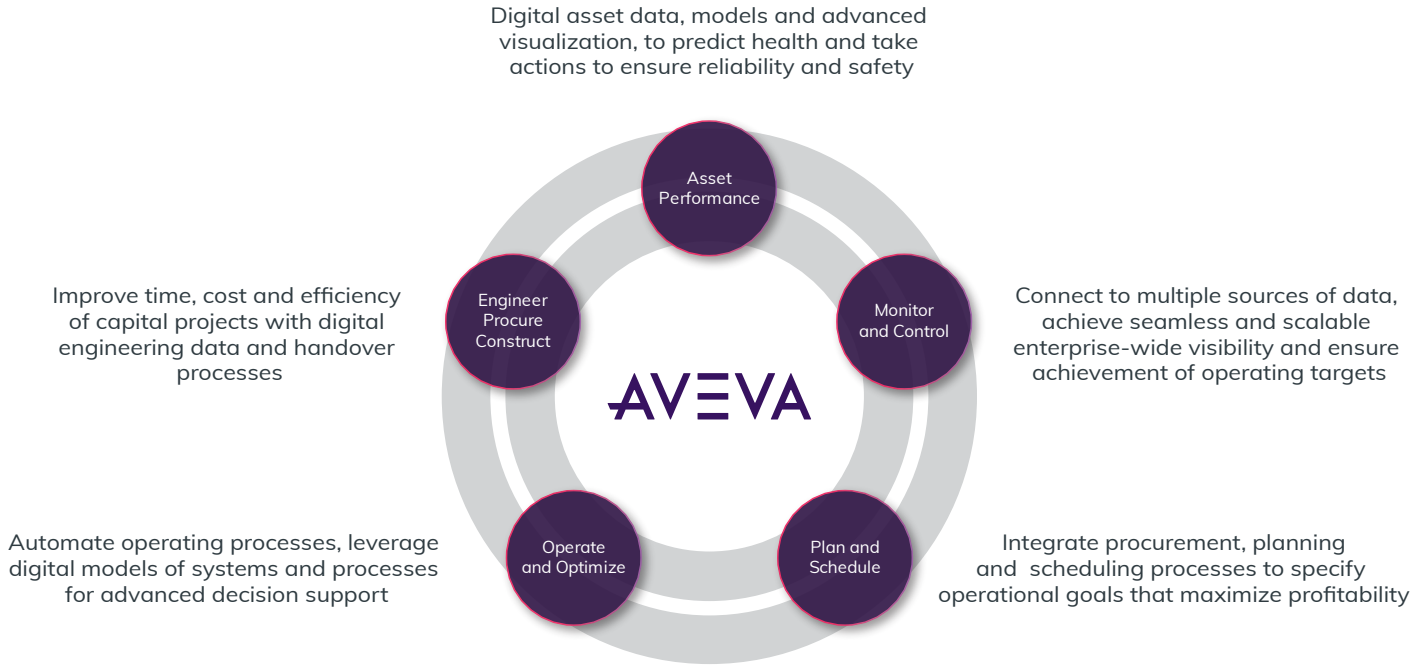
Digital Acceleration is an acceleration of this journey, and it must be driven from the top of the organization. Senior management make and drive decisions across silos to establish the "new way of working". The impact on corporate performance and shareholder returns is significant.



For more than two decades, AVEVA has been enabling chemical corporations to sustain and improve their return on net assets (RONA). Sustained improvement in manufacturing availability has a significant effect on RONA.

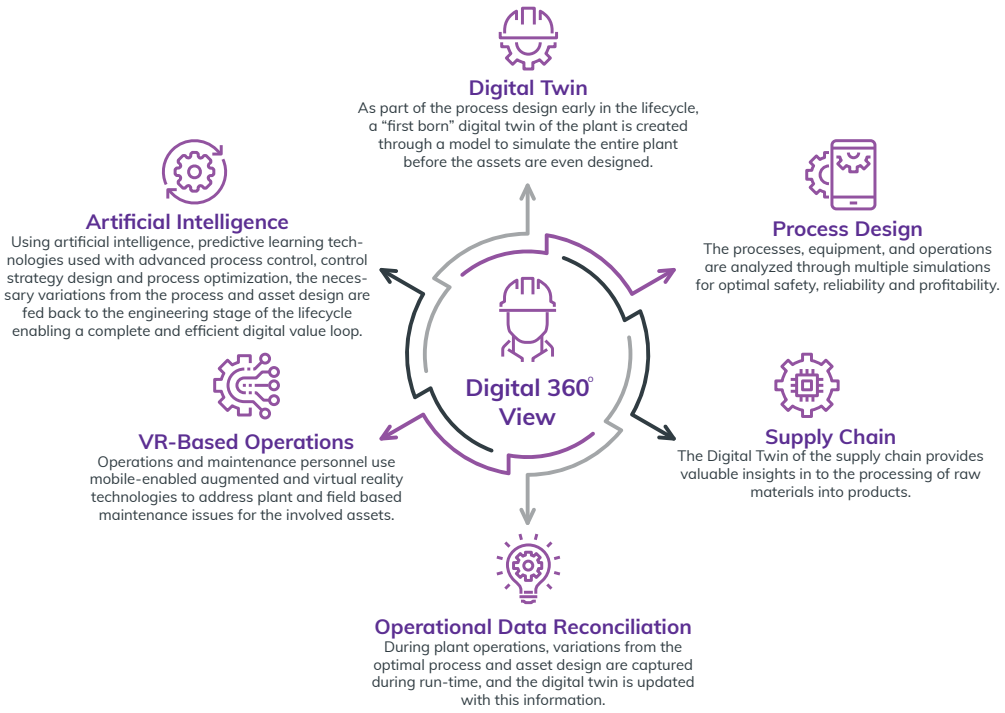
Two Lifecycles of Chemical Plants

AVEVA contributes significantly to our customers' RONA by transforming the performance of designing, constructing and operating plants. In our perspective, chemical plants have two lifecycles: (1) the Asset Lifecycle which includes plant and process design, procurement, construction, maintenance and revamps, and (2) the Operations Lifecycle which includes monitoring and controlling, planning and scheduling, and various methods of production optimization.



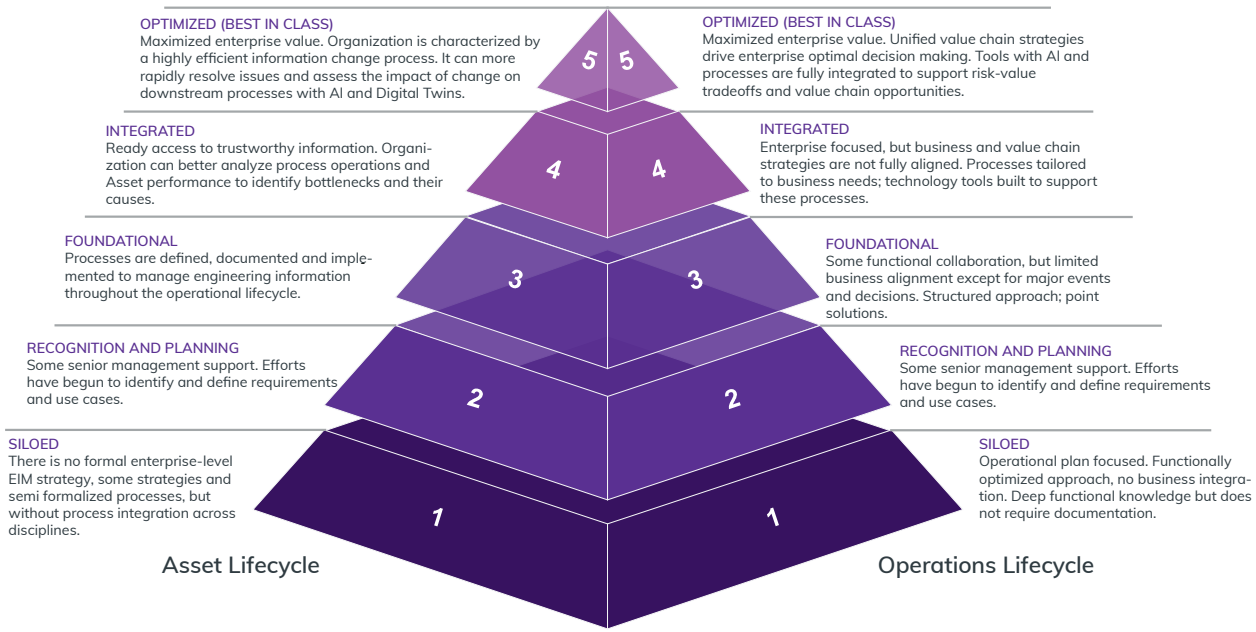
A Complete Digital Twin

AVEVA's technology enables you to bring the Digital Twin from Engineering Design into Operations, thus providing the work to the worker and allowing a 360o digital view of the plant.

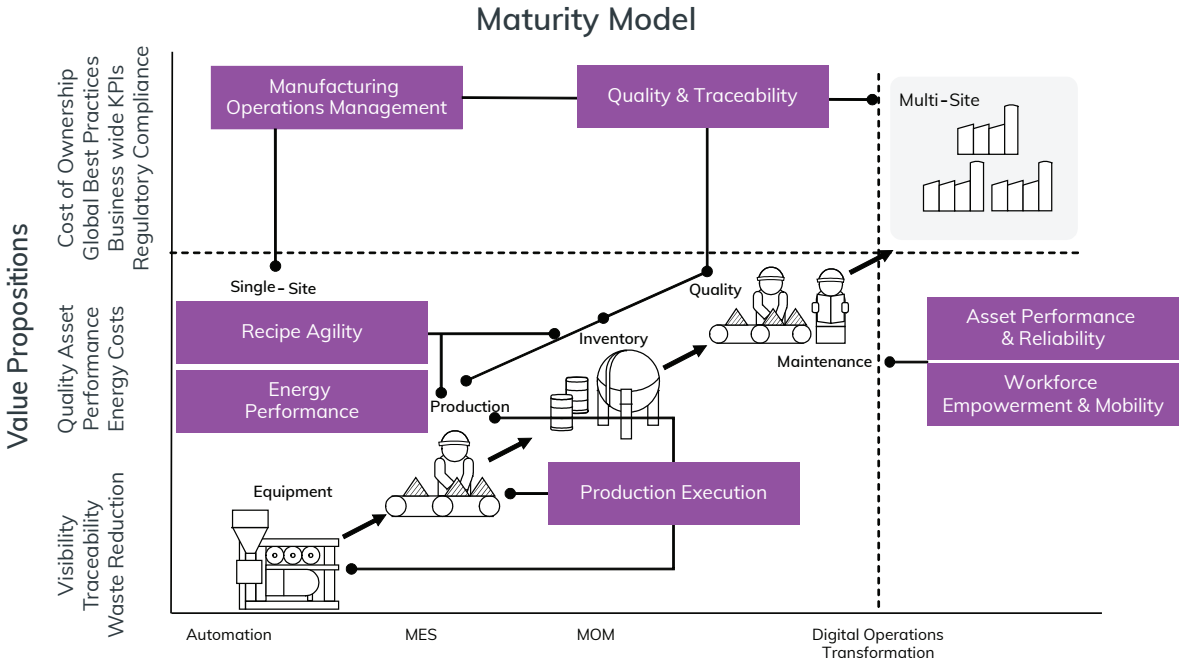


Digital Maturity Model

To be successful, the concept of "digital maturity" is extremely important. Transformed work and digital acceleration are limited by a corporation's ability to collaborate across organization silos. Organization silos are necessary, but the ability to collaborate is a key requirement. AVEVA's Digital Maturity Model is derived from industry analyst maturity models and our unique combination of experience in both lifecycles. The chemical enterprise can have various levels of digital transformation maturity for the asset and operations lifecycles. A key objective is to steadily increase this maturity.



One of the highest contributing factor to the success of digital acceleration is the rollout of the implementation. A successful rollout approach implements holistic combinations of transformed work, technology, strategy and culture change. Task groups can be operational areas within plants or work teams within the broader corporation.



23+ Years of Digital Acceleration

AVEVA has more than 23 years of experience in digital acceleration. During this time, we have learned what predicts successes over failures.

Digital transformation efforts failed because:

- They started as technology projects
- They were implemented as technology roadmaps
- There was insufficient culture change managment
- There was either insufficient or too much innovation
- There was insufficient integration of people, work process, strategy and technology

Digital transformation succeeded because:

- They started as work transformation projects
- They were implemented as holistic combinations of people, work process, strategy and technology
- Senior management actively and constantly sponsors the "new way of working"
- They applied best-practice methods for culture change
- They developed methods to maximize end-user adoption

AVEVA's Rules for Successful Digital Transformation:

1

Make Digital Transformation a business priority, not an IT project.

2

Start the transformation by creating a strategic digital roadmap, visibly supported by Executive Leadership.

3

Think BIG but start small – create a proof of concept with high ROI in selected area.

Digital Acceleration in the Chemicals Industry

AVEVA contributes significantly to our customers' RONA by transforming the performance of designing, constructing and operating plants.

ASCEND PERFORMANCE MATERIALS

Transformed how field operators and control room operators contribute to quality and cost

Tight collaboration of field operators collaborate closely with technical services teams

Access to real-time information and applied statistical quality control empower operators to "own" performance, quality, and operational costs

Sustained improvement in availability and reduced maintenance costs

Consistently the lost cost producer of Nylon 6,6 resin

BASF We create chemistry

Digital transformation as a methodology to further increase market differentiation

Transform how field operators and technical services teams contribute to availability and to asset utilization: and tighten collaboration

Achieved mobile operator driven reliability with increased access to information

Enable predictive maintenance and machine learning to reduce unscheduled downtime, improve asset reliability, availability and performance

DSM

Asset Utilisation: Improved line efficiency, improved OEE; decreased operational costs, reduction of waste, increased yield. Contribution to EBITDA

Project ROI of 6 months

Track & Trace: Reduced raw materials and scrap, increased yield, increased in-spec product 0/4, shorter production runs

Tighter integration with ERP-based processes (SCM, Inventory)

Exchange DEP best practices and SOPs

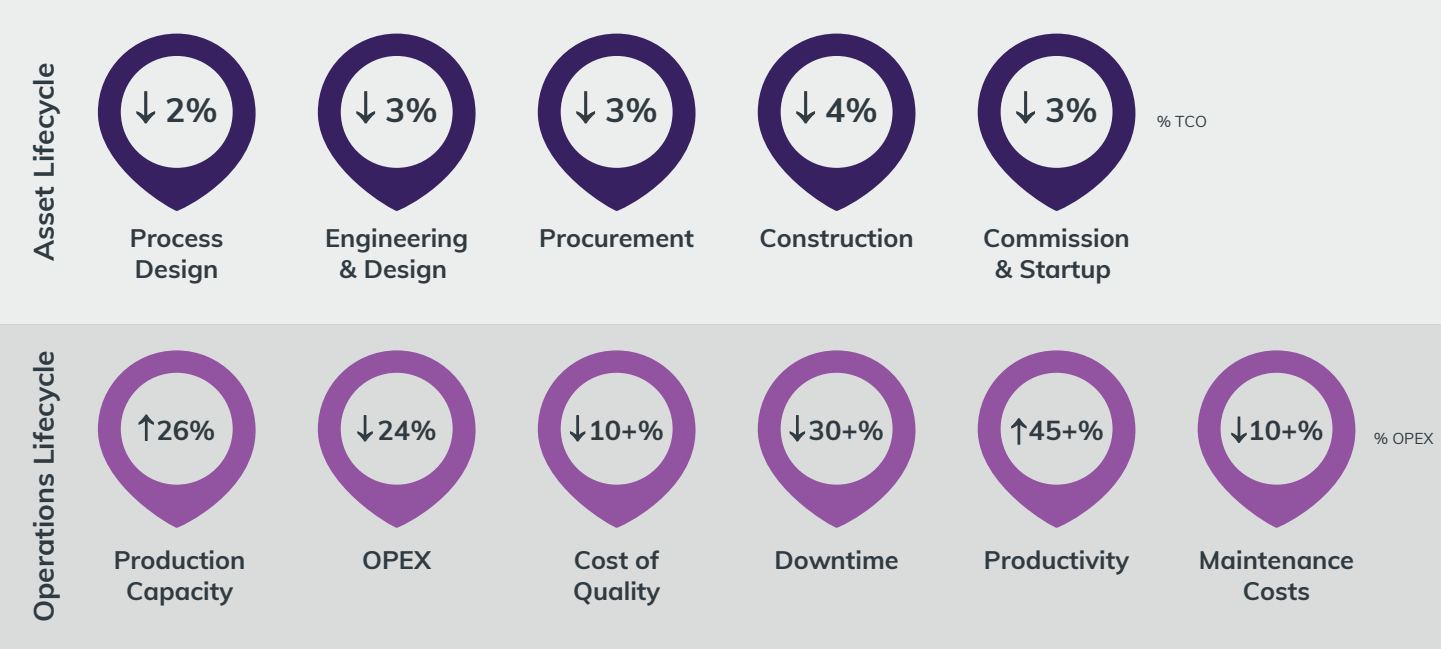
Henkel

Ability to see data on world-wide energy consumption in real-time

Performance improvements in OEE average 4.5% after just one year

Solution support for growth and sustainability strategies reduced energy consumption by 9% - €15 million in energy costs savings

Executives of leading chemical corporations know that they must drive strategies to accelerate the digital transformation of their manufacturing operations to increase profit and stay competitive. There are many ways to increase profit: improve and optimize process operations, reduce OPEX by streamlining the supply chain, reducing energy cost, etc. Tremendous value can be derived along the digital acceleration journey—in both the Asset and Operations Lifecycles.



Digital Transformation Partner

Why Partner with AVEVA for Your Digital Acceleration?

As you begin your digital acceleration journey, you will need to partner with a company that can provide both business and technical advice, and ensure that your strategic roadmap for digital acceleration will be successfully implemented. After helping you create the complete digital acceleration roadmap, AVEVA will continue to help implement the processes needed to transform work, streamline the work processes, and reduce the wasted work. We use a holistic approach that integrates both horizontally and vertically within your organization, making us best suited for this initiative.

AVEVA is trusted by global industry leaders as the leader in digital transformation of process manufacturing companies. As we connect people with processes and technology, we deliver comprehensive Value Chain solutions for the process industries. We work with a global partner network that is focused on the complete digital acceleration journey.

Our Differentiators

1

Where We Add Value

- More competitive
  - On a $1B capital projectm save $100M
  - Save $90M-$320M/yr implementing asset performance, planning & Scheduling and optimization
- Higher digital maturity and combined value across the asset and operations lifecycles

2

Our Credentials

- 23+ years in Digital Transformation
- 19 of top 20 petroleum companies, 22 of top 40 chemical companies, all 15 of largest EPCs
- 300+ refineries, most of the world's petro chemical crackers, 900K miles of pipeline

3

Our Understanding Of Your Challenges and Needs

- Stay competitive in the digital age-make better decisions faster
- Keep pace across the oil & gas industry

4

Our Approach to Digital Transformation

- People, Process & Technology-in that order
- A holistic approach which empowers all personnel with the right enabling technologies and training to transform work

AVEVA is uniquely focused on digital transformation in plant engineering, procurement, construction, and operation, and we are trusted by the world's leading integrated, national and independent chemical corporations to act as your digital transformation partner.

AVEVA

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