

WHITEPAPER

Digital acceleration in the power industry

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Executive summary

The power industry has talked about Digital Transformation for a few years.

But what is Digital Transformation?

In the most general definition, Digital Transformation is the replacement of a non-digital or manual processes with a digital process. It can also be the replacement of a digital technology with a newer digital technology. Going paperless is an easy and tangible example.

This paper discusses how power utilities can use digital technologies to significantly reduce major operational and maintenance costs to gain significant competitive advantages. The paper also guides power utilities how to create and navigate a successful digital transformation journey. Several successful digital transformation stories from well-known power industry leaders are highlighted.

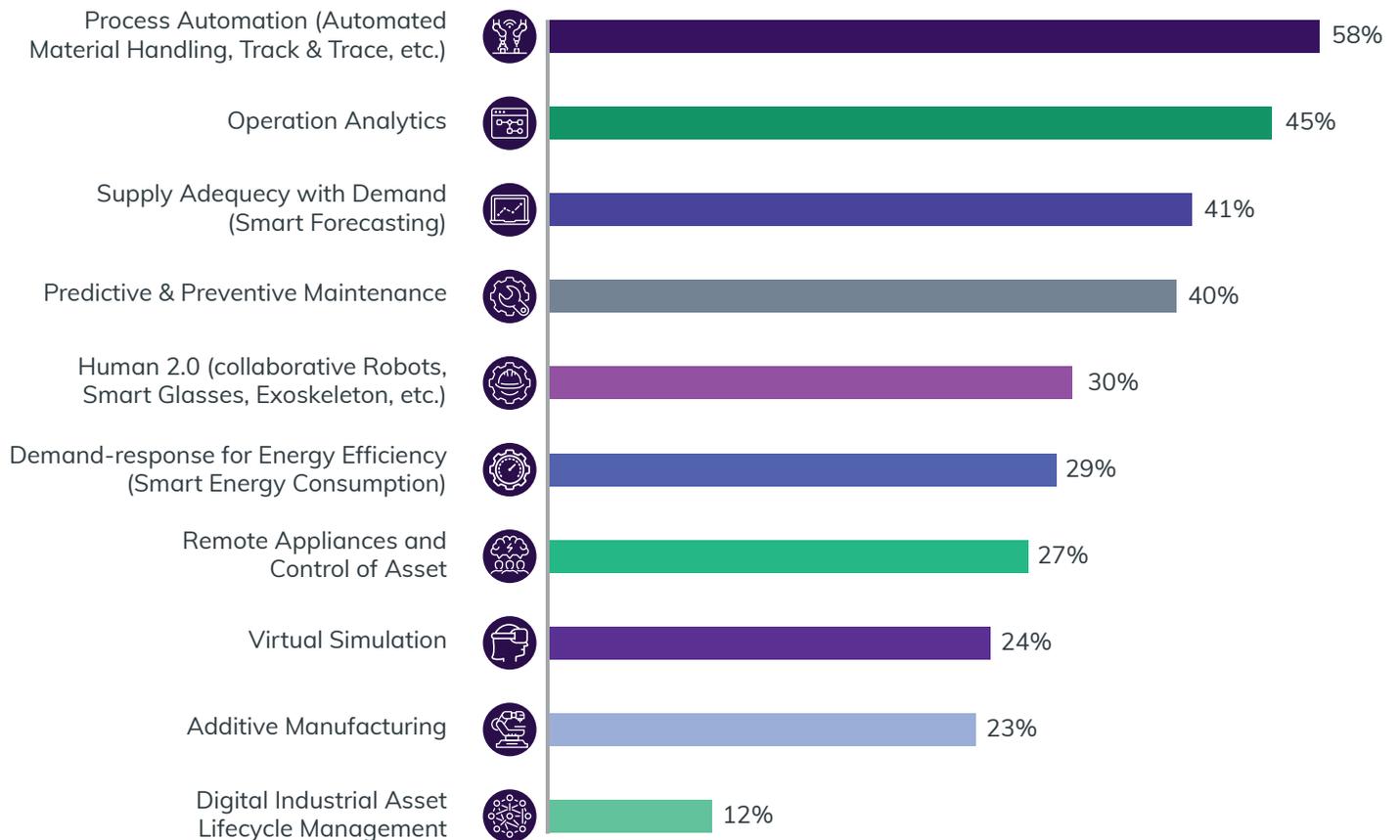
Introduction

While leading corporations in the power and utilities industries 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 if it 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 power and utility corporations to increase asset utilization through higher manufacturing efficiency, including the efficiencies of multi-plant sites and integrated value chains. For larger power corporations, a key challenge is accelerating the value; finding and using methods to transform operations faster than the competition.

Digital Transformation trends

The digital wave is beginning to significantly impact the power industry, and very quickly. Capgemini surveyed 200 senior executives from global utility companies and found that they expect productivity improvement from digital technologies to increase to 27% in next 5 years, compared to 21% improvement in past 25 years.

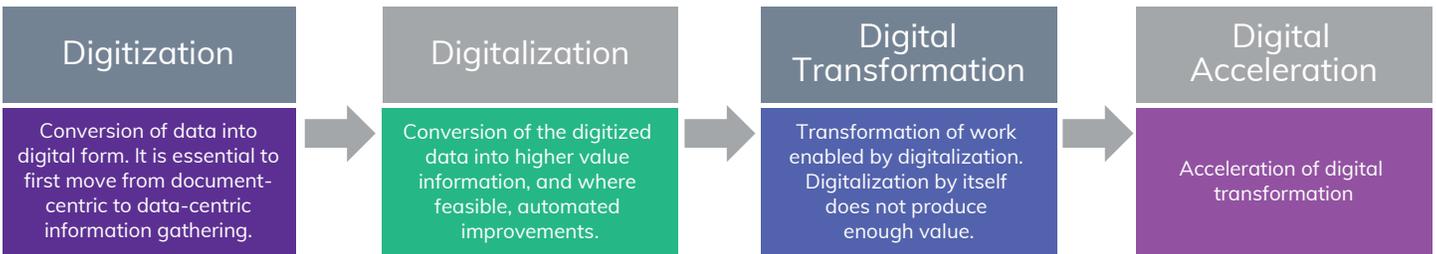


Source: Capgemini Digital Transformation Institute, digital utilities survey, February-March 2017; percentages indicate share of organizations implementing a particular application

As shown above, utility players are implementing a wide range of applications. Digital Transformation can take years but the value is enormous. Using these technologies, a power plant could expect to significantly reduce its major costs—fuel costs by 28%, maintenance costs by 20%, and operations costs (by 19.5%).

Value drivers for Digital acceleration

There are several key value drivers for accelerating digital transformation across the power industries. Leading 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 electricity – where it’s generated, transmitted, and distributed – becomes more valuable to win and grow business from their key customers. There isn’t enough data (yet) on the power industry digital wave, but many analysts believe that lessons learned from other industries are relevant.



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.

Digital transformation 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

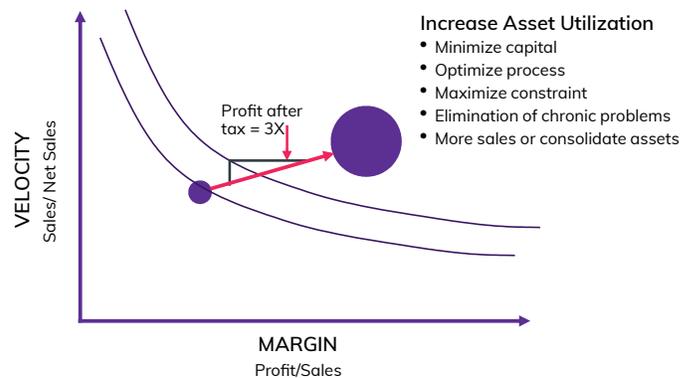
There are a range of economic benefits for several digital acceleration strategies but the objectives of a digital plant remain the same:

1. Drive down production costs: Save \$20M annually for the average combined-cycle power plant in US
2. Improve productivity: Targeting a 27% improvement in productivity in just the next five years
3. Reduce emissions: Cut global share of CO2 emissions by 4.7% (=133M passenger vehicles) by 2025

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 power corporations to sustain and improve their return on net assets (RONA). Sustained improvement in manufacturing availability has a significant effect on RONA.



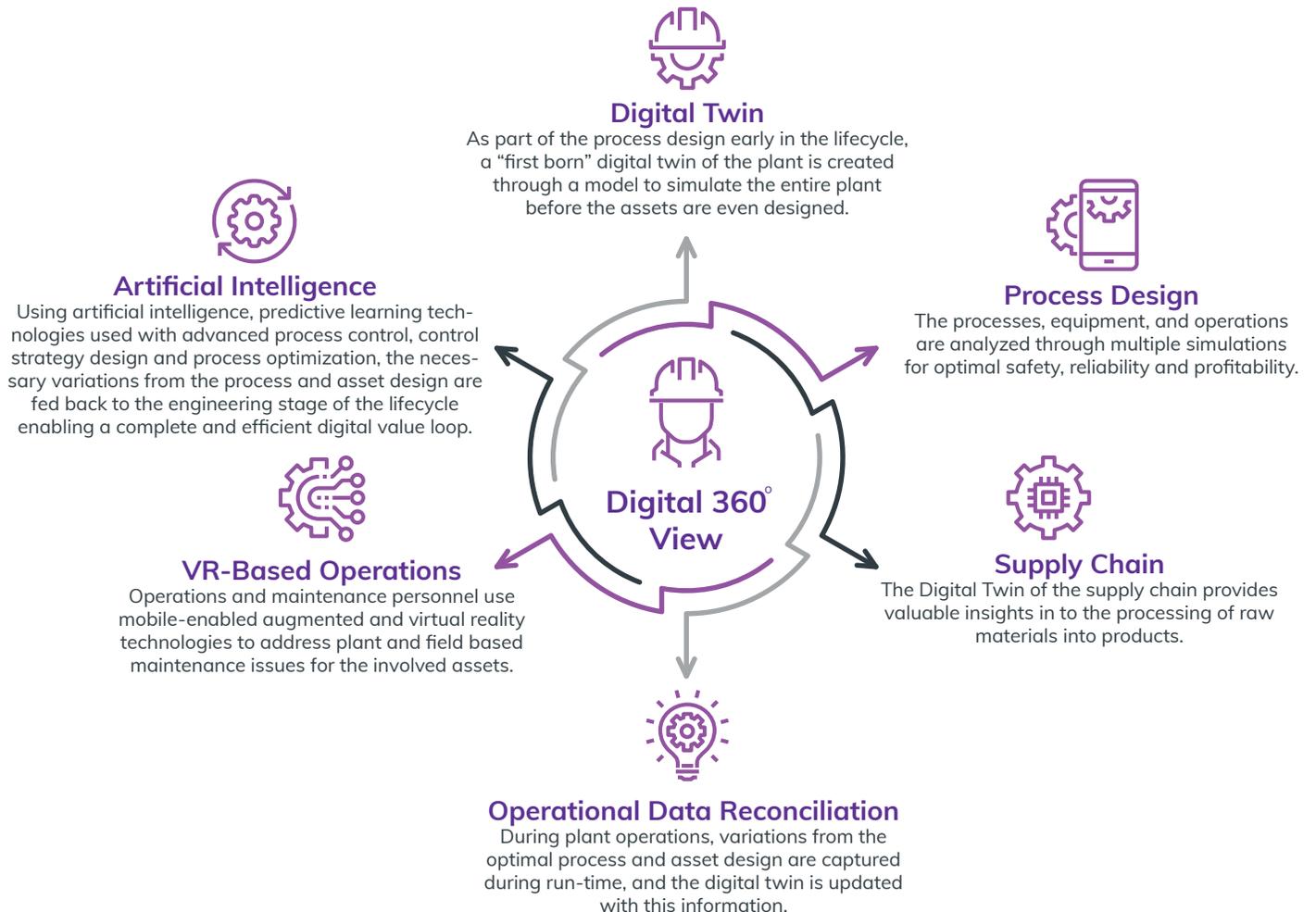
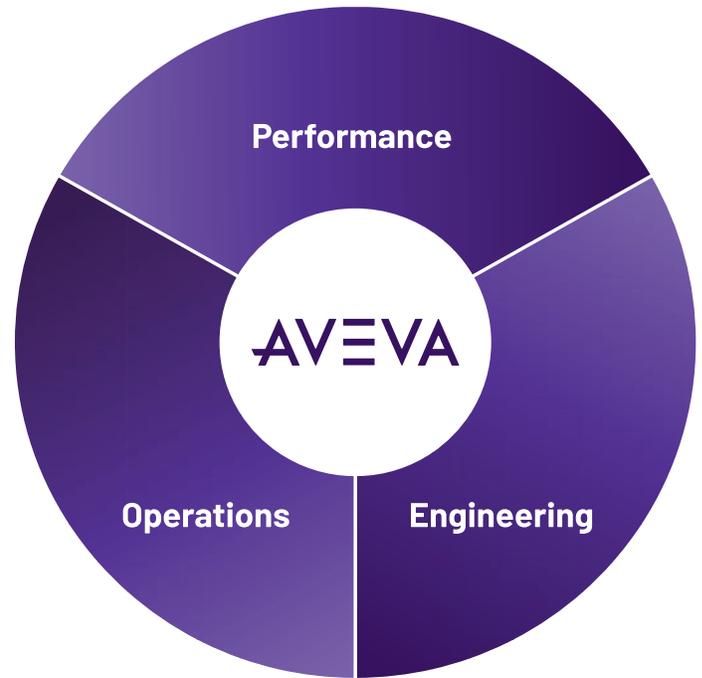
Digital Twin

Two lifecycles of power plants

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

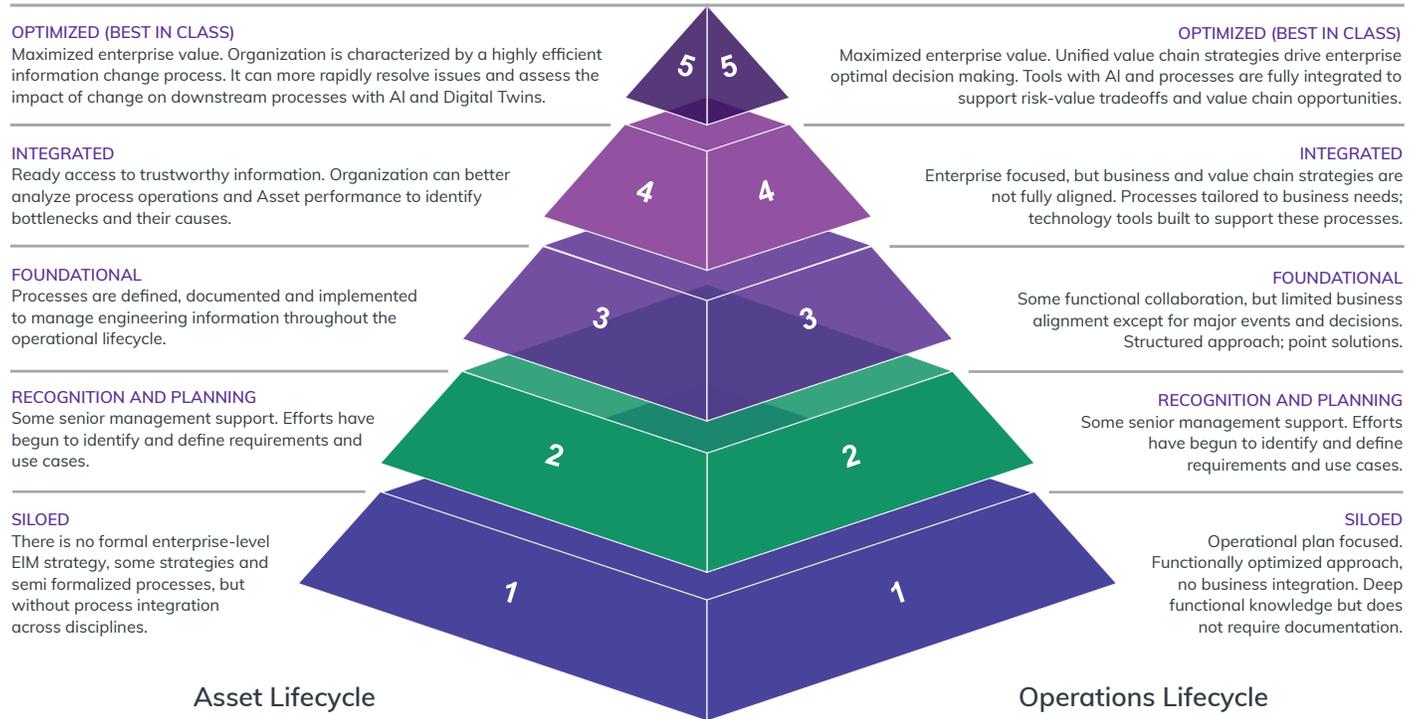
A complete Digital Twin

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 360° 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 energy 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 factors 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.



25+ years of digital acceleration

25+ years of digital acceleration

AVEVA has more than 50 years in industrial software innovation and 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 management
- 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 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 project 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

3

Our understanding of your challenges and needs

- Stay competitive in the digital age – make better decisions faster
- Keep pace across the power & utilities industry

2

Our credentials

- 50+ years in industrial software innovation
- 25+ years in Digital Transformation
- Customer references from the world's largest generation fleets in Europe, Africa, USA, Latin America

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 power and utilities companies, including the world's largest generation fleets in Europe, Africa, USA, and Latin America.

Digital acceleration success powered by AVEVA

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



- Accelerated growth and maximize asset yield
- Pool of experts doesn't have to scale with asset growth
- \$50MM of "catches" already found
- Rapidly sharing knowledge



- Nuclear owner-operators come to Orano for their domain expertise and processes.
- They've implemented our preferred methodology
- With all the tools are in place, Orano can be up and running in 3 days at the start of a project



- Geographically dispersed workforce requires continuous training
- Provides training for multiple plants each with multiple units and unique configurations
- Cloud-based approach enables employees to access training wherever and whenever.



- Accelerated growth across four continents, maximize asset yield
- Small pool of experts supports global fleet

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

For more information about AVEVA, please visit: [aveva.com](https://www.aveva.com)

About the author

Livia K. Wiley is the Director of Industry Marketing at AVEVA. As AVEVA's chief advocate to industry, she helps define the marketing strategy of AVEVA's offerings for both established industry markets (oil & gas, chemicals, power, mining) and new growth verticals (hybrid, infrastructure, water, renewables). Livia uses her more than 20 years of experience in process and marketing automation and optimization to provide thought leadership and industry-specific content that helps drive significant business value for AVEVA's partners and customers. Livia holds a B.Sc. in Chemical Engineering from Queen's University, and a M.Eng in Chemical Engineering from the University of Houston.