



Unlocking the Digital Thread with SAP PLM

Gareth Webb, SAP
November 15, 2023

Public

PLM Road Map™ & PDT Europe 2023

The Digital Thread in a Heterogeneous, Extended Enterprise Reality

A call for PLM Professionals to share their knowledge & experience

November 15 & 16



80%

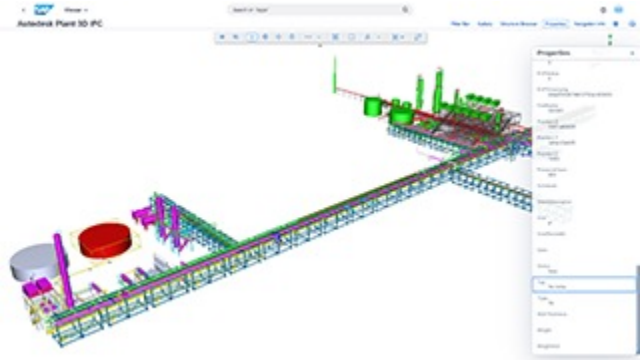
of business requirements met without customization (FESTO)

20%

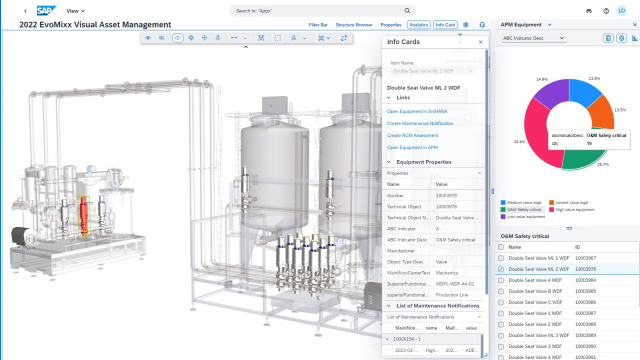
increase in customer satisfaction (SAP Benchmarking)

10%

Reduction in carbon emission (engie)



Consumer Products

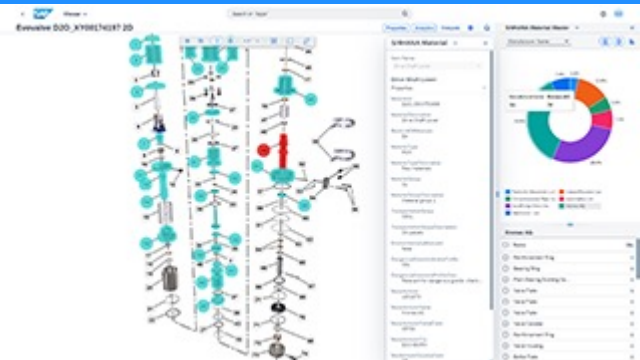
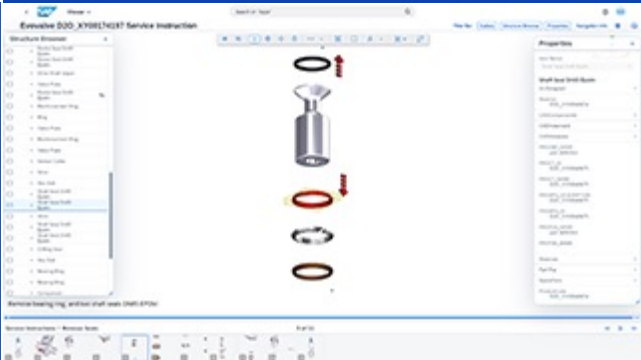


Chemicals

Oil & Gas



Industrial Manufacturing

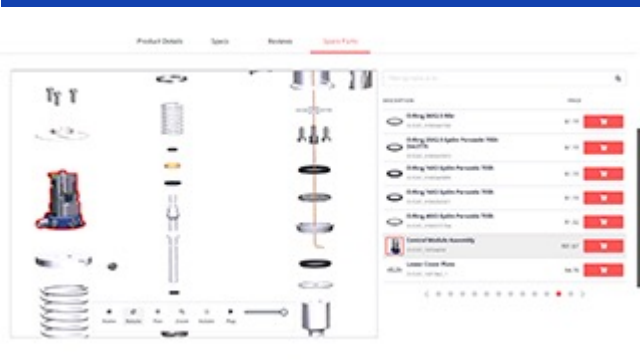


Aerospace & Defense



Automotive

High Tech



Construction

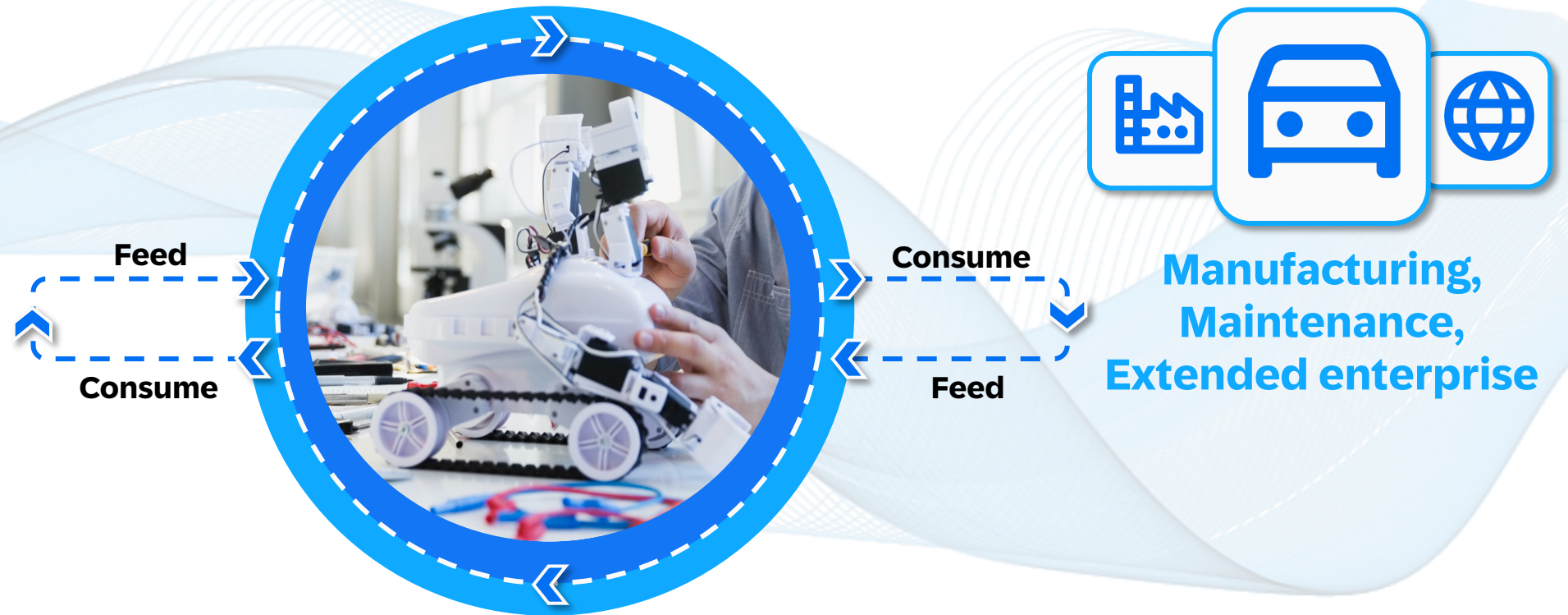


Transformative Potential

Delivering an **product centric design** across the value chain



Design data



A **single digital thread** that **integrates all the information**, performance, real-time data and feedback on a Product / Equipment / Assets from inception to sunset.

Increase Capital-Intensive Operations Productivity and Sustainability

with SAP Capital Engineering Project Management

Challenges

- Develops, produces, and markets hydrocarbons from the world's largest natural gas field
- Company operates 14 Liquefied Natural Gas (LNG) trains;
- Total annual production capacity of 70 million tons
- A new LNG project for \$87 Billion CAPEX
- Manual Information handoff from engineering to operations error prone and time consuming

Value Drivers

- Automate to support expansion: company is building 3 new LNG Trains each with approx. 1 million assets/elements
- Digitalize for seamless handoff of capex project engineering information to operations
- Deliver efficient asset operations – bring asset data into a digital system to automate a SPIR (Spare Part Interchangeability Review) process

Expected Business Benefits

-2-4% CAPEX costs

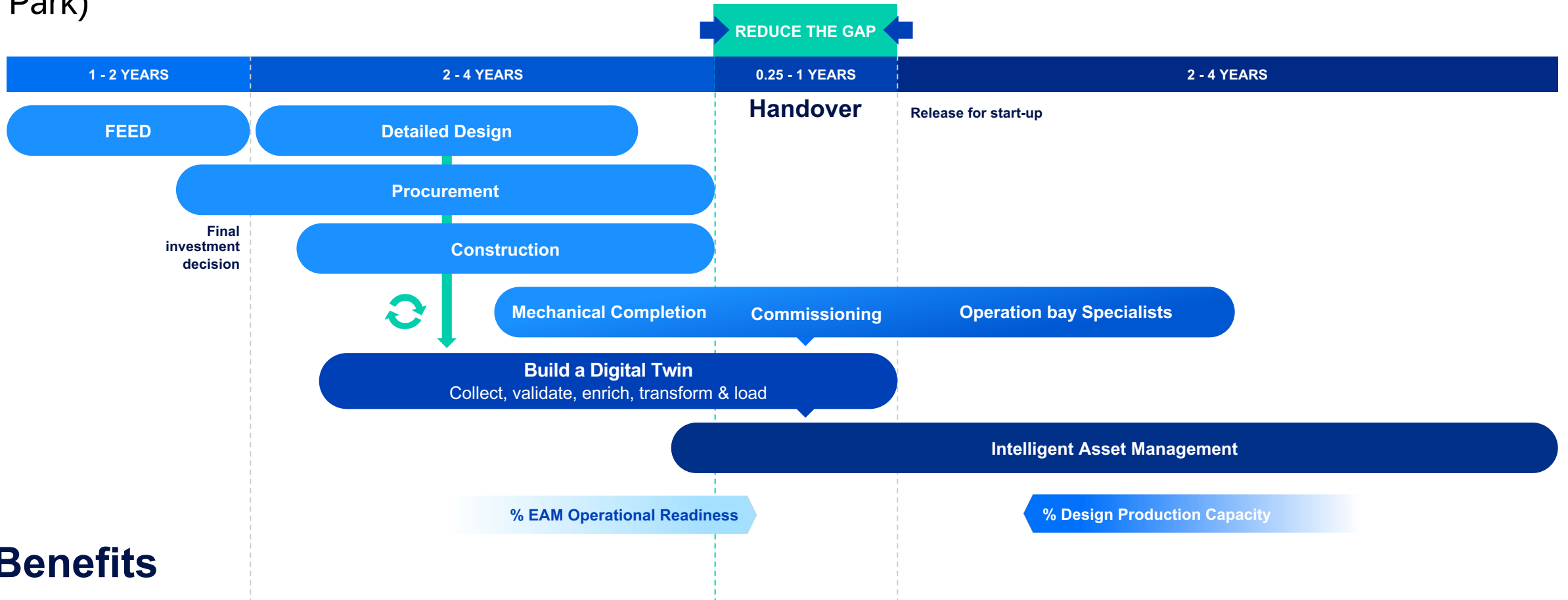
+40% Engineering time

Zero handover time

+75% Productive time

Project results of incorporating a Digital Twin

Digital twin provides early operational readiness for a Capital Intensive Project (e.g. new Energy Park)

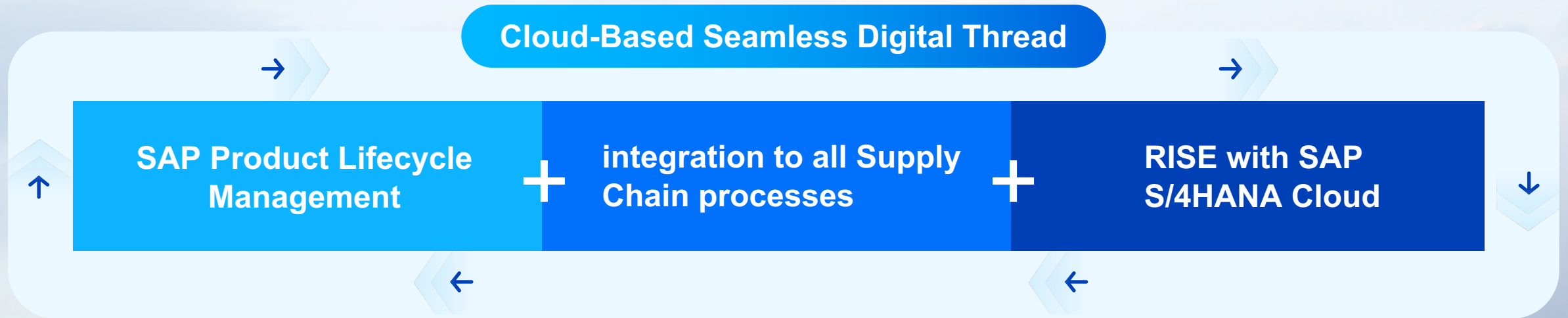


Benefits

- ▶ Reduced extended start-up operations costs
- ▶ Lower operations costs
- ▶ Improved warranty management
- ▶ Faster time to production
- ▶ Fewer environment, health, and safety risks
- ▶ Foundation for solid reliability

Introducing the Digital Thread in the Cloud

A complete digital thread offered as a cloud solution from SAP



Public Cloud / Private Cloud Edition & Private Tailored Option



Thank you.

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Public



More Industry Examples



Keeping baggage moving with an AR App app for service teams

with SAP Enterprise Product Development

- Automatic notifications to alert service technicians about breakdowns, plus a calendar function that enables them to view and plan work steps more efficiently
- Made live machine data, spare part availability, and service readiness checklists available at the touch of a button – replacing paperwork and calls to head office
- Designed AR animations and 3D visualizations for routine maintenance tasks such as oil changes, as well as troubleshooting and repairing common problems to help technicians resolve issues faster

Higher First-time fix rates and reduced time-to-fix anticipated

“Collaborating with SAP on this pilot project has been a great experience; the team is very proactive and take an agile approach. We’re excited to bring the AR app for service technicians to life and are already considering how we can apply AR to other use cases across the business.” Michael Brehe, Head of Product Lifecycle Management, BEUMER Group GmbH & Co. KG



How Do Improved Product Cost Predictions Enable Intelligent Cancer Care?

with SAP Product Lifecycle Costing

- Greater visibility and control throughout the product lifecycle to identify more-accurate costs
- Eliminated complex, tedious, and time-consuming processes by integrating spreadsheet capabilities
- Flexible costing structures that cater to integration of early design structures and BOMs directly from SAP and other third-party solutions
- Ability to add predictions that account for rigging, freight, installation, and labor costs

Reducing Complexity and Increasing Visibility with SAP Product Lifecycle Costing

"Varian's vision is 'A World Without Fear of Cancer.' SAP Product Lifecycle Costing helps us make better decisions that help us focus on product design and development and enable us to focus on our vision." Simin Doddamani, SAP Technical Analyst, Varian Medical Systems Inc. (a Siemens Healthineers company)



Standardizing Project and Product Management Processes

with SAP S/4HANA and SAP Product Lifecycle Management

- Improved speed to market for initiatives and a better return on investment, with the ability to track each initiative and test the return metrics ahead of launch
- Reduction in the number of non-value-added initiatives
- Artwork right first time
- Real-time reports, reallocating previously wasted time to value-adding initiatives

One initiative management process, providing reliability to the business

“SAP S/4HANA and the SAP Product Lifecycle Management application are helping us develop a common, standardized project and product management system and process based on industry best practices.” John Hobson, Regional CIO, Kellogg Europe

How Can Efficient R&D Help Get Innovative Food Products to Market Faster?

with SAP Recipe Development

- Work with one global development system for research and development to get products to market more quickly
- Ensure full transparency on every product development
- Standardize and harmonize development processes globally
- Manage the high complexity caused by a broad product range
- Provide a single basis for all subsequent product development, sales, and supply chain processes
- Achieve a high degree of data automation and digitalization
- Ensure a high level of intellectual property protection
- Reduce system maintenance effort

More than 60,000 new recipes managed per year around the globe

“The major goal of implementing SAP Recipe Development was to run a product development system that is both standardized and flexible as much as possible.”

Dr. Manuel Renz, Team Leader Business Solutions, Döhler GmbH



Harmonizing Lifecycle Management for Engineer-to-Order Projects with SAP® Enterprise Product Development



Before: Challenges and Opportunities

- Insufficiently formalized business processes for engineer-to-order (ETO) compressed air station projects
- Difficulties in providing technicians with relevant, up-to-date information at the point of consumption
- Lack of harmonized workflows, preventing seamless collaboration between internal and external stakeholders

Why SAP

- Cloud-based SAP® Enterprise Product Development solution, aligning with KAESER's cloud strategy
- Powerful access control capabilities, enabling internal and external users to work together securely
- Integration with document management systems via SAP S/4HANA®, simplifying process automation
- Intuitive, mobile-friendly browser-based user interface, built with SAP Fiori® user experience
- SAP Workflow Management service in SAP Extension Suite, part of SAP Business Technology Platform, supporting collaboration and enriching the user experience with 2D and 3D visualizations
- Product lifecycle management knowledge and project support from SAP Services and Support experts
- Potential to explore use cases in connected products and systems engineering in the future

After: Value-Driven Results

- Simplified access to project documentation, including technical documents and visualization
- Automated business processes with integrated cross-company workflows, boosting collaboration and efficiency
- Enabled earlier detection of design errors, leading to better quality and lower costs
- Harmonized lifecycle management process across the enterprise for ETO compressed air station projects

“The SAP Enterprise Product Development solution makes it much **easier for internal and external stakeholders to collaborate** on engineer-to-order projects – so we can always deliver the right solutions to meet the customer’s needs.”

Falko Lameter, CIO, KAESER KOMPRESSOREN SE

15,000

Product lifecycles are now fully managed using the SAP solution, boosting product development efficiency

900

Stakeholders are using the SAP solution to collaborate on product development worldwide

**KAESER
KOMPRESSOREN SE**
Coburg, Germany
www.kaeser.com

Industry
Industrial
Machinery and
Components

Products and Services
Compressed air products,
services, and systems

Employees
6,000

Revenue
€800 million

Featured Solutions
SAP Enterprise Product Development,
SAP S/4HANA, SAP Business
Technology Platform, and SAP Services
and Support

THE BEST RUN



ENGIE: Leading the Journey Toward a Carbon-Neutral World

ENGIE is a global leader in low-carbon energy and services. It's mission, or *raison d'être*, is to act to accelerate the transition to a carbon-neutral world through reduced energy consumption and more environmentally friendly solutions.

To ensure **reliable, efficient, and sustainable electricity**, ENGIE's growing solar capacity needed to operate reliably. With hundreds of solar installations currently around the world, ENGIE sought intelligent technology to manage and maintain its assets without any disruption while maximizing economic value.

THE BEST RUN 





Moving to **Renewable Energy** with Predictive Maintenance in Solar Farms

In South America, ENGIE Chile launched a number of energy projects as part of its commitment to end coal-fired power generation by substituting it with renewables such as solar. To achieve its goals and efficiently manage its assets, which are located thousands of miles away from the center of operations, ENGIE embarked on a transformation with the SAP Enterprise Product Development and SAP Predictive Asset Insights solutions. These solutions enable ENGIE to create simulation-based digital twin technology to improve plant performance.

Thanks to the technology, ENGIE saw significant performance improvements. For example, the accuracy of the digital twin enabled the ENGIE team to successfully determine the precise location of several broken fuses at the very moment of their failure and schedule maintenance accordingly.

The predictive nature of the physical model in the digital twin also provided ENGIE with the ability to anticipate component failures and optimize the maintenance activities of its assets.



Optimizing Maintenance Activities in Solar Plants with SAP Solutions



Before: Challenges and Opportunities

- Remote location of solar farms, with long travel times and high costs needed to perform maintenance
- Lack of responsiveness in case of downtime, impacting asset availability and overall plant performance
- Fast-growing business that requires agile solutions to support future growth objectives

Why SAP

- Ability to simulate the impact of weather variations on plant performance with digital twin technologies by using the SAP Enterprise Product Development solution and autogenerate alerts in case of anormal behaviors using the SAP® Predictive Asset Insights solution
- SAP Business Technology Platform for its robust integration capabilities
- Ability to connect operational and financial data with SAP S/4HANA® and industry cloud solutions from SAP

After: Value-Driven Results

- Reliability of alerts generated by the digital twin, with accurate measurement of the impact of maintenance activities on asset health
- Improved asset uptime due to automated and accurate alerts that enable ENGIE to quickly fix failures and degradation
- Lower CO₂ emissions by avoiding unnecessary maintenance team travel
- Opportunity to further optimize by fully leveraging integrated machine learning algorithms
- Fast implementation process, with a project successfully conducted in seven months

“Our digital twin gave us useful insights on how to be more efficient. **The results were exciting:** 100% accurate remote recognition of production losses and a systematic evaluation of the impact of maintenance activities on plant performance.”

Gabriel Marcuz, COO, ENGIE Energía Chile

11%

Reduction in production losses, thanks to the prompt replacement of broken fuses

35%

Productivity gains on maintenance, travel, and diagnosis activities

10%

Reduction in carbon emissions

100%

Reliability of alerts generated by the digital twin

ENGIE
La Défense, France
www.engie.com

Industry
Utilities

Products and Services
Gas and renewable energy services

Employees
102,000

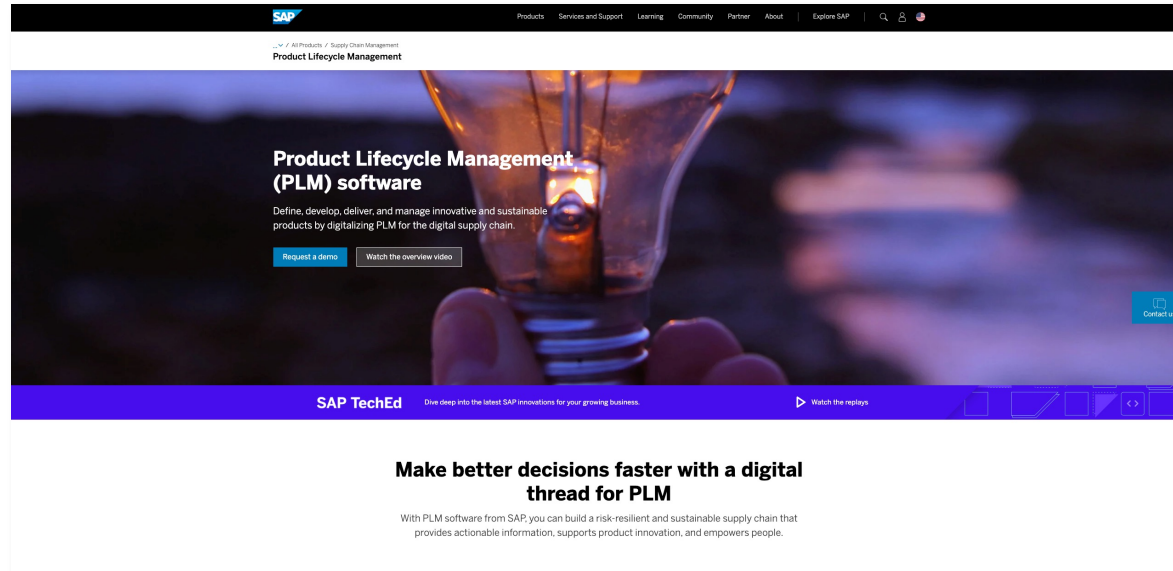
Revenue
€58 billion

Featured Solutions
SAP Predictive Asset Insights, SAP Enterprise Product Development, SAP Business Technology Platform, and SAP S/4HANA



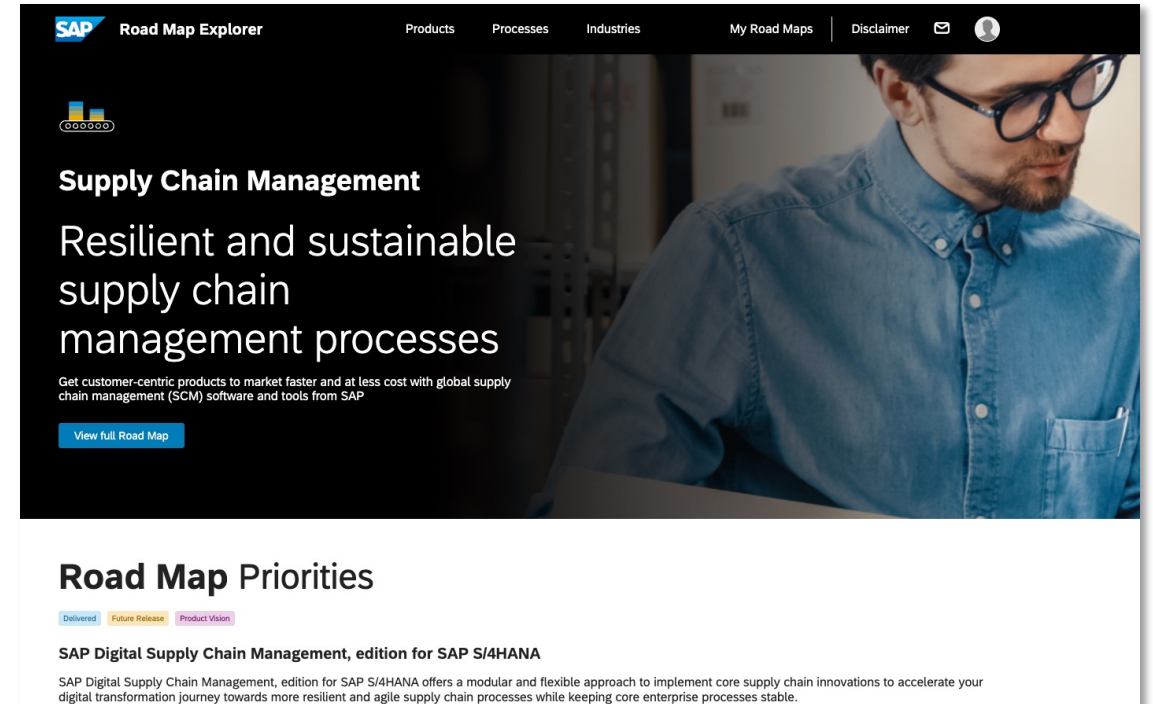
Appendix

Downloads and Recommendations



The screenshot shows the SAP Product Lifecycle Management (PLM) software landing page. The header includes the SAP logo and navigation links for Products, Services and Support, Learning, Community, Partner, About, and Explore SAP. The main content area features a large image of a hand holding a glowing lightbulb. The text reads: "Product Lifecycle Management (PLM) software" and "Define, develop, deliver, and manage innovative and sustainable products by digitalizing PLM for the digital supply chain." Below this, there are buttons for "Request a demo" and "Watch the overview video". A blue banner at the bottom of the image area says "SAP TechEd" and "Dive deep into the latest SAP innovations for your growing business." Below the banner, the text says "Make better decisions faster with a digital thread for PLM" and "With PLM software from SAP, you can build a risk-resilient and sustainable supply chain that provides actionable information, supports product innovation, and empowers people."

sap.com/PLM



The screenshot shows the SAP Road Map Explorer landing page. The header includes the SAP logo and navigation links for Products, Processes, Industries, My Road Maps, and Disclaimer. The main content area features a large image of a man in a blue shirt and glasses looking at a screen. The text reads: "Supply Chain Management Resilient and sustainable supply chain management processes" and "Get customer-centric products to market faster and at less cost with global supply chain management (SCM) software and tools from SAP." Below this, there is a button for "View full Road Map". A section titled "Road Map Priorities" includes a progress bar with "Delivered", "Future Release", and "Product Vision" categories. Below this, the text says "SAP Digital Supply Chain Management, edition for SAP S/4HANA" and "SAP Digital Supply Chain Management, edition for SAP S/4HANA offers a modular and flexible approach to implement core supply chain innovations to accelerate your digital transformation journey towards more resilient and agile supply chain processes while keeping core enterprise processes stable."

<https://roadmaps.sap.com/business-views/000D3AA914A11EEBB4CE482F1BC2B930>

Whitepaper on Sustainable Product Innovation – download at sap.com/PLM

SAP Digital Supply Chain

SAP Thought Leadership Paper | PUBLIC
Sustainable Design

How Sustainable Product Innovation is Changing the Game in Product Development



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How Sustainable Product Innovation is Changing the Game in Product Development

Executive Overview

Sustainable product innovation goes beyond just reducing environmental impact. It also presents opportunities for cost savings, increased efficiency, and improved competitiveness. By considering sustainability from the early stages of product development, companies can identify innovative materials, manufacturing processes, and supply chain strategies that not only enhance environmental performance but also drive business growth.



1. "An introduction to circular design," Ellen MacArthur Foundation, June 2022.

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