



SAP Enterprise Product Development | PUBLIC

Digitalize Product Development with a **Digital Thread**

Define, Develop, and Deliver
Intelligent and Sustainable Products

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Digitalize Product Development in the Cloud

Leading product-centric organizations aspire to create a resilient and sustainable supply chain – one that provides actionable information, supports product innovation, and empowers people. Yet many companies still run through departmental silos, inhibiting digitalized, end-to-end business processes. The SAP® Enterprise Product Development solution helps **digitalize product development** in the cloud so you can define, develop, and deliver intelligent, sustainable products to market faster than ever.

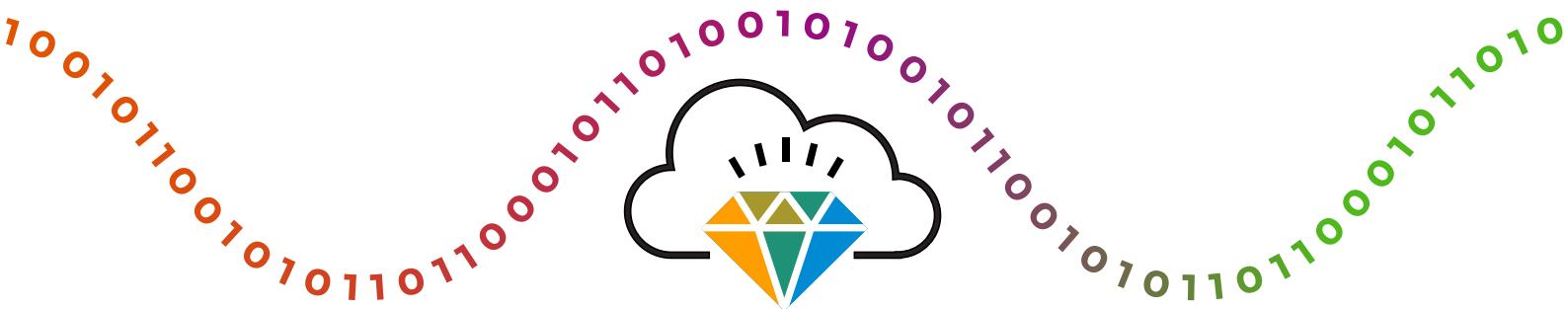
Today's customers demand individualized, sustainable, and high-quality products and delivery within shorter time frames. Customers have more interest in products and their raw materials, and they expect your sourcing activities to be transparent. At the same time, products are becoming increasingly complex, and you must consider regulatory mandates and sustainability requirements in your designs.

What's the best way for product development teams in discrete manufacturing and consumer products companies to effectively address these needs? It's time to reduce departmental silos

and integrate product data across the supply chain by creating a digital thread across the extended enterprise.

TO THRIVE IN A DIGITAL WORLD, GET CONNECTED

Gone are the days when you could make a process improvement or add more headcount to help get a product out the door and into the hands of loyal customers. Incremental productivity growth is no longer enough to meet rising business pressures. In today's business climate, the challenges are significant (see [Figure 1](#)).



What's the best way for product development teams to **adapt effectively** to so much change? It's time to establish a digital thread across the extended enterprise.

Figure 1: Key Product Development Challenges for Manufacturers

Discrete manufacturers



Decreasing the effort and costs required for frequent design changes



Tracking and managing continuous change in product requirements



Improving the collaboration process for product development to do more with less



Managing product complexity, ensuring quality, and meeting compliance requirements



Catching errors earlier to control costs and maximize profits

Process manufacturers



Scaling business to cope with the complexity of multiple product families and target markets



Reducing costs by designing to create low development and production costs



Improving teamwork and creating an efficient work environment to support collaboration across roles



Providing high-quality, consistent data to identify and avoid errors

All manufacturers



Managing data flows throughout the lifecycle, including operational data and feedback



Efficiently designing products that meet legal requirements and sustainability demands

Whether you're a discrete manufacturing or consumer products company, you must create a digital thread with processes that help your business get connected and stay connected across the extended enterprise.

That means you must replace manual, time-consuming, and e-mail-based workflows with modern software solutions that automate

business processes for product development and product data management.

You need consistent product data that is available from a single source of truth. And you must release product information from its traditional silo in product data-management systems so it can be used throughout the supply chain – not just in design.

What's more, your supply chain must link your ecosystem of customers, suppliers, contract manufacturers, logistics providers, and other partners. And you need a solution that connects through the full lifecycle of your product.

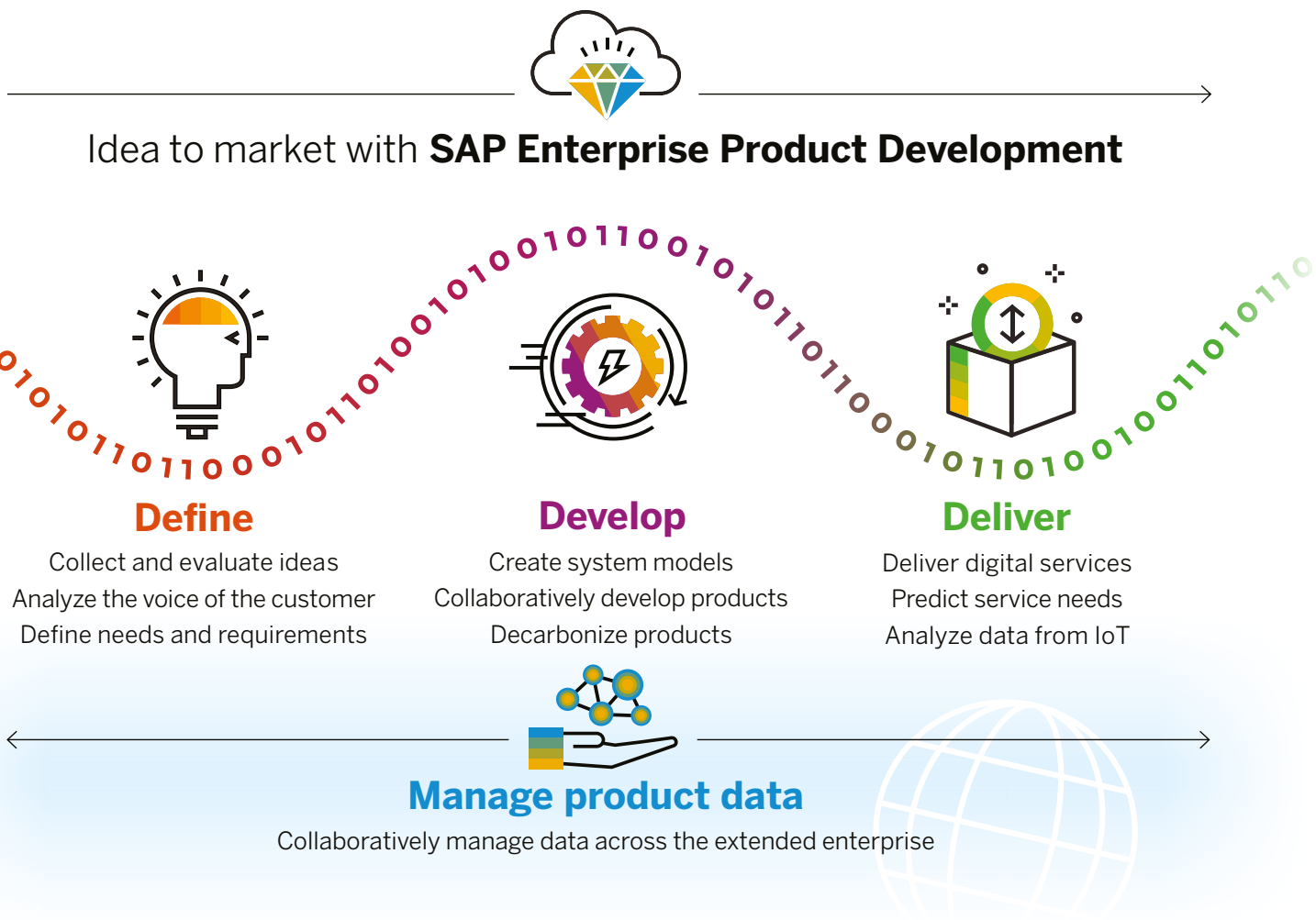
It's important for product teams to bring new ideas, innovations, and changes to production faster. You need to use and reuse existing knowledge and infuse product development with higher levels of efficiency. The goal: to optimize all aspects of the product lifecycle from the earliest stages of design so that products are as

intelligent and sustainable as possible when they are industrialized, launched, and sold.

MAKE BETTER DECISIONS WITH A DIGITAL THREAD

SAP Enterprise Product Development offers the flexibility you need to rethink product development with a focus on integrated business processes across the supply chain (see Figure 2). To support an ongoing collaborative product innovation process, the solution links product development teams with downstream operations across the extended enterprise.

Figure 2: Key Business Processes Supported by SAP Enterprise Product Development

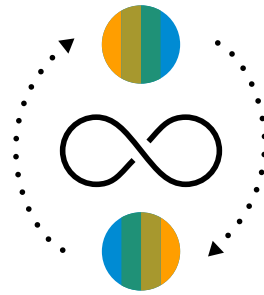


The solution empowers product teams with data and insight, decreasing time to value through faster product innovation. It can help you iterate in shorter cycles and introduce new or changed products through a better understanding of needs and requirements.

SAP Enterprise Product Development can help you realize a higher return on your product development investment while increasing margins and decarbonizing your products. By supporting early problem detection and faster issue resolution, the solution helps ensure reliable product launches while reducing operational and financial risk.

The solution supports three key product-development processes – define, develop, and deliver – that help your business build intelligent, sustainable products. You can create an ever-evolving, design-to-operate value chain that enables product development based on customer behavior and needs. It also supports the product management process, which helps you make the best use of product data across the extended enterprise.

The following sections describe how you can use the solution to digitalize product development in these key processes. Each section also describes the business processes supported by SAP Enterprise Product Development.



SAP Enterprise Product Development helps you optimize all aspects of the product lifecycle from the earliest stages of design so that products are as **intelligent and sustainable** as possible when they are industrialized, launched, and sold.



Define Products Desired by Customers



Define



Develop



Deliver

Defining the products that customers want is complex. You need to collect a variety of ideas that represent the voice of the customer, reflect market insights, and capture insights from downstream systems such as sales data, quality issues, failure modes, and many more. From there, you must prioritize needs and define product requirements.

SAP Enterprise Product Development supports three processes that help you manage the definition of intelligent and sustainable products (see Figure 3). The following sections describe how the solution supports these product definition processes.

Innovation Management



Innovation managers want to be able to collect and evaluate ideas. SAP plans to include processes that help innovation managers use SAP Enterprise Product Development to run innovation management campaigns and identify emerging trends before the competition.

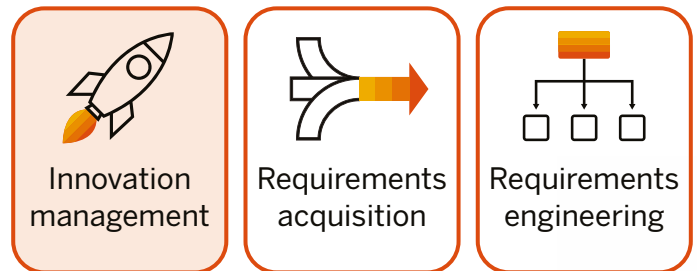
With SAP Enterprise Product Development, you can:

- Manage innovation campaigns across the extended enterprise
- Create and evaluate product-improvement ideas collaboratively with the extended enterprise
- Motivate people to contribute ideas through gamification

Figure 3: Product Definition Processes Supported by SAP Enterprise Product Development



Define



*Shaded tile indicates planned future functionality.



Define

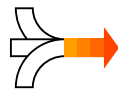


Develop



Deliver

Requirements Acquisition

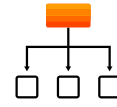


Product managers who want to grow the market share of their products need to pay attention to data. Market insights, the voice of the customer, and enterprise data from SAP S/4HANA® are essential to identify product improvement needs. SAP Enterprise Product Development supports the requirements acquisition process by helping product managers collect product feedback and manage product needs based on insights delivered through various channels.

With SAP Enterprise Product Development, you can:

- Create and manage feedback plans
- Allow the extended enterprise to submit feedback and improvement ideas
- Analyze and classify feedback
- Create and prioritize needs, helping you develop useful product improvement plans
- Develop requirements based on needs, with needs linked to product requirements

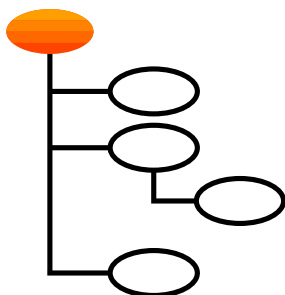
Requirements Engineering



Once needs are identified and prioritized, requirements engineers need solutions to help them define requirement models, list detailed specifications, and understand the impact of change on the supply chain. SAP Enterprise Product Development supports the requirements engineering process by helping requirements engineers manage product requirement structures with integrated impact analysis insights.

With SAP Enterprise Product Development, you can:

- Store and manage requirements in a central repository and share requirements with business partners
- Assess requirements based on defined criteria
- Launch impact and lineage analyses on requirements, model objects, and associated objects
- Edit one requirement model concurrently across the extended enterprise
- Establish import and export requirements based on standard formats, such as the Requirements Interchange Format



SAP Enterprise Product Development helps requirements engineers manage product requirement structures with integrated impact **analysis insights**.

Develop Products for Today's Competitive Market



To develop intelligent and sustainable products, it's important to connect product development processes with the entire supply chain. You need processes that help you streamline development, collaboration, and industrialization tasks.

SAP Enterprise Product Development supports key business processes that help you digitalize product development (see Figure 4). The following sections describe these processes.

Systems Engineering

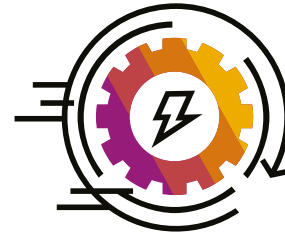


To manage increasing product complexity and reduce product lifecycle costs, systems engineers develop products and systems models on a functional and logical level. These models serve as the basis for orchestrating the detailed design work by experts from disciplines such as mechanical, electric, electronic, and software engineering. SAP Enterprise Product Development supports the model-based systems engineering process, which enables product teams to manage complex systems across the extended enterprise.

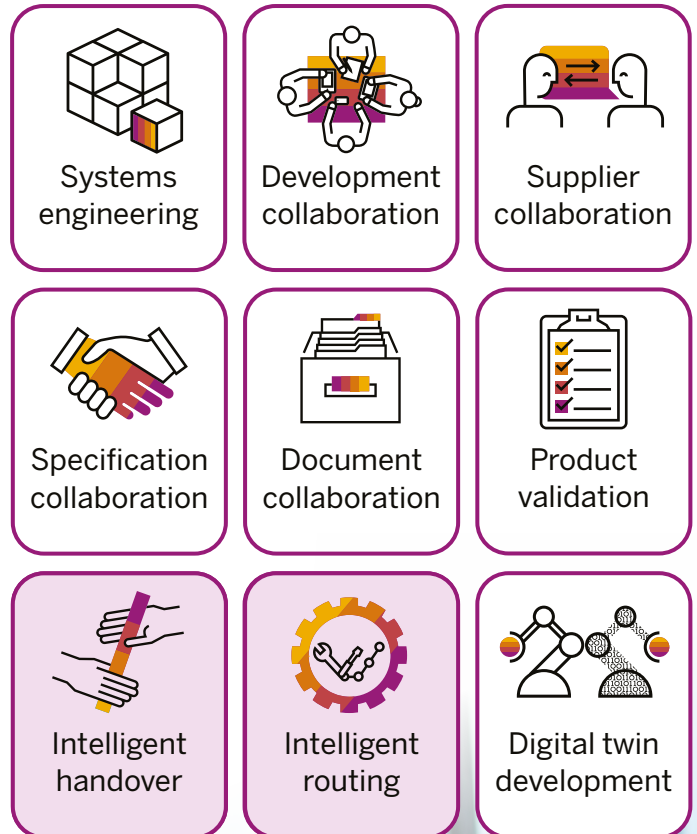
With SAP Enterprise Product Development, you can:

- Define product features and variants in early development phases
- Analyze change impacts on various business objects
- Collaborate with system engineering partners throughout the enterprise
- Create and manage system architectures and behavior based on the standard Systems Modeling Language (SysML)
- Define and visualize object links on objects and in a dependency matrix

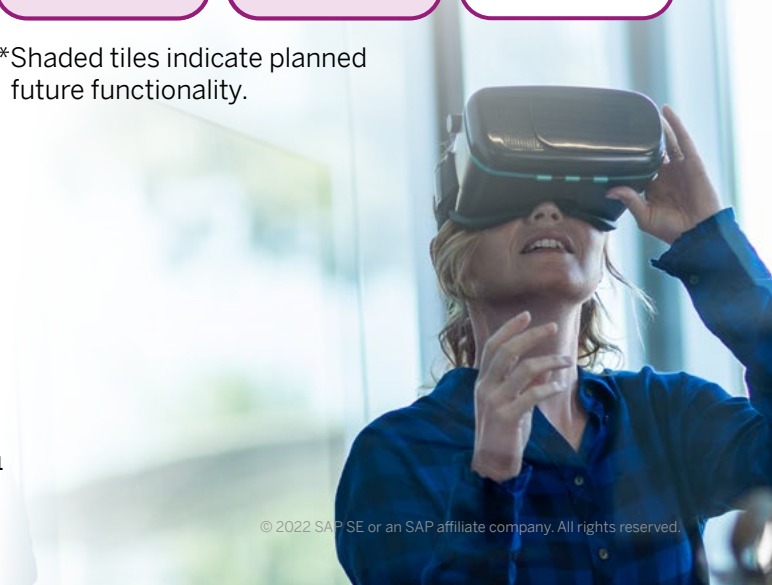
Figure 4: Product Development Processes Supported by SAP Enterprise Product Development



Develop



*Shaded tiles indicate planned future functionality.





Define



Develop



Deliver

Development Collaboration

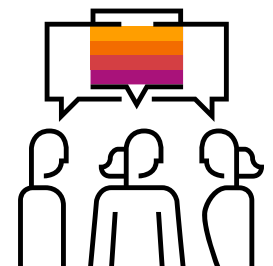


Product developers seldom work alone. They interact with a wide variety of development partners and suppliers to design and industrialize products. This interaction requires a secure, straightforward collaboration process for structured and unstructured product data. Involving development partners across the extended enterprise speeds up time to market and reduces product development costs. SAP Enterprise Product Development supports development collaboration, helping product teams work together to develop and change their designs to meet customer and business goals.

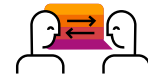
With SAP Enterprise Product Development, you can:

- Import and share business objects (such as bills of material (BOMs), specifications, 2D and 3D models, and documents) across disciplines and enterprise borders
- Add business objects from other systems as references and establish a single source of truth
- Collaboratively redline and visually annotate 2D and 3D design models through integration with the SAP Engineering Control Center integration tool
- Create and use workflows to safely exchange information across the extended enterprise
- Leverage change and version control features to help ensure consistency of product data

By helping product teams work together to develop and change their designs to meet customer and business goals, SAP Enterprise Product Development supports **development collaboration**.



Supplier Collaboration



Sourcing of components and raw materials is a collaborative process. It requires product developers and technical buyers to exchange product data such as BOMs, specifications, and documents. Streamlining the quotation process in product development can reduce product costs. SAP Enterprise Product Development supports supplier collaboration, helping product developers exchange product data with suppliers and vendors to support quotation processes.

With SAP Enterprise Product Development, you can:

- Create collaborative relationships and invite suppliers from Ariba® Network to exchange product data
- Link collaborations to RFX projects in Ariba Network
- Select the right collaboration partners from multiple suppliers using flexible search and filter options
- Safely exchange information using workflow-driven collaboration with suppliers
- Participate in bidirectional exchange of documents from the document management feature of SAP S/4HANA



Define



Develop



Deliver

Specification Collaboration



In their effort to manage all product-specific information centrally, product developers want to create a single source of truth that includes greenhouse gas information so they can lower lifecycle costs and decarbonize products. SAP Enterprise Product Development supports specification collaboration by helping product teams exchange specification information across the extended enterprise.

With SAP Enterprise Product Development, you can:

- Collaborate with suppliers on provisional specifications, reducing the time to final specification
- Assign provisional specifications to collaborations, allowing data exchange with suppliers
- Transfer data from a provisional specification back to the source system for use in recipes
- Load value sets for specifications from a source system and use them to work with provisional specifications
- Store greenhouse gas emissions data as provisional specifications

Document Collaboration



For product developers, being able to exchange documents and collaborate with team members and business partners is an essential characteristic of a connected supply chain. SAP Enterprise Product Development supports document collaboration by helping product teams exchange documents and work together across the extended enterprise.

With SAP Enterprise Product Development, you can:

- Create and use virtual spaces to collaborate with people across and beyond your enterprise
- Store, share, and review engineering documents in collaborations
- Manage document versions to help ensure that changes are properly communicated and that teams use the most current information
- Reduce manual effort and understand current document status in the review process
- Upload documents from the document management feature of SAP S/4HANA
- Create robust collaboration workflows, including an integrated task-management workflow



Define



Develop



Deliver

Product Validation



Creating high product quality is equally important as delivering innovative product functions and features. To help ensure that products meet company standards, quality managers want to define and execute tests. SAP Enterprise Product Development supports product verification and validation, enabling quality managers to check whether the development matches the associated requirements. Quality managers can create reusable test artifacts and organize them into flexible testing projects.

With SAP Enterprise Product Development, you can:

- Plan and execute virtual or physical tests against product requirements
- Organize test cases into test plans and define test executions
- Track testing progress and execution results
- Record test results
- Check test case coverage of each requirement model

Intelligent Handover



To avoid disconnects in the supply chain, product teams need to synchronize engineering BOMs (EBOMs); manufacturing BOMs (MBOMs); order or project BOMs; transport, installation, and service BOMs; as well as equipment across the lifecycle of a product. SAP plans to include functionality in SAP Enterprise Product Development to support an intelligent handover process that enables product teams to hand over product models and transform them into different product model views, supporting the promise of the digital thread.

With SAP Enterprise Product Development, you can:

- Maintain an uninterrupted digital thread between all stages in the product lifecycle
- Accelerate the technology transfer process from R&D to manufacturing
- Avoid the challenges of inconsistent or missing data
- Reduce manual workloads, freeing up key resources in the scale-up process
- Improve time to market
- Integrate content and processes with asset management solutions from SAP
- Support integration with SAP S/4HANA, allowing SAP Enterprise Product Development to pass information to enterprise asset management and maintenance solutions from SAP



Define



Develop



Deliver

Intelligent Routing



As part of the industrialization of a new or changed product, subject-matter experts must create and maintain routings. This manual activity requires significant time and expertise. SAP plans to include functionality in SAP Enterprise Product Development to support an intelligent routing process that uses machine learning to automatically create routings for standard and configurable products – reducing costs and increasing production scheduling accuracy.

With SAP Enterprise Product Development, you can:

- Use machine learning to create recommendations for operations, sequences, work centers, production resources and tools, and inspection characteristics based on historical data
- Allocate components to operations automatically
- Determine standard values for routing operations based on historical routings, production orders, and confirmations
- Improve on-time delivery for customers

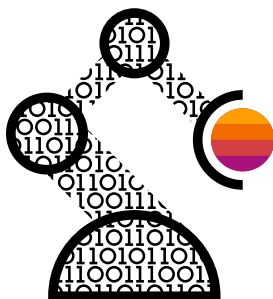
Digital Twin Development



We view digital twins as a technology that can elevate business processes and business models to the next level. In product development, a digital twin allows product teams to reuse engineering models. Teams also can use data to create a digital twin product or service that can be sold alongside physical products. SAP Enterprise Product Development supports digital twin development, which helps product teams create smart, digital products by combining the Internet of Things (IoT) with engineering models.

With SAP Enterprise Product Development, you can:

- Develop digital twins based on engineering and machine learning models
- Reuse models from the engineering phase to cost-effectively create digital twins
- Test and calibrate a digital twin to verify and validate data
- Prepare the production master data and physical product fingerprint together with a digital twin
- Define hardware and sensor requirements for the productive use of a digital twin



SAP Enterprise Product Development supports **digital twin** development, which helps product teams create smart, digital products by combining the IoT with engineering models.

Deliver Product Experiences with Valuable Digital Services



Define



Develop



Deliver

To increase customer satisfaction and boost your bottom line, you need to optimize product delivery processes. You can also enhance the value of your offerings by adding digital products and services that help grow your after-sales business.

SAP Enterprise Product Development supports key business processes that help you get the most from the aftermarket business (see Figure 5). The following sections describe these processes.

Visual Spares and Service

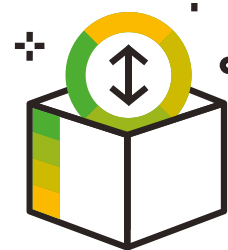


Aftermarket sales and service providers can act as profit centers for your business, growing revenue and increasing brand loyalty. SAP Enterprise Product Development supports a visual spares and service process that helps product teams turn 2D and 3D product data into interactive spare parts catalogs. These catalogs can increase aftermarket revenues, enhance customer retention, and reduce the return rate of incorrectly ordered spare parts.

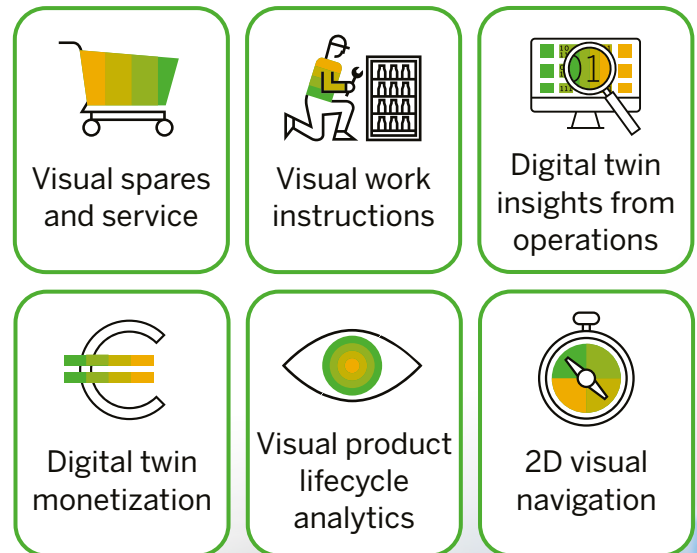
With SAP Enterprise Product Development, you can:

- Import 2D raster, 2D vector, and 3D computer-aided design (CAD) product data into catalogs
- Author and tag 2D hot spots
- Associate 3D CAD EBOMs to software BOMs (SBOMs)
- Author 3D exploded view and visual work instructions
- Publish 2D and 3D visualizations to enable data streaming into the SAP Commerce Cloud solution project "Spartacus," the open-source, online storefront project

Figure 5: Product Delivery Processes Supported by SAP Enterprise Product Development



Deliver





Define



Develop



Deliver

Visual Work Instructions



To make service operations cost-effective and provide the best quality for customers, service providers need to optimize product installations, repairs, or routine maintenance. SAP Enterprise Product Development supports a visual work instructions process that helps you transform 3D product data into interactive service instructions. If you use third-party service companies, these instructions can help optimize maintenance schedules, reduce downtimes, and decrease errors and duplicate work.

With SAP Enterprise Product Development, you can:

- Import 3D CAD data
- Associate 3D CAD EBOMs or MBOMs with SBOMs
- Apply materials to enhance 3D visualization
- Add author views, animations, and annotations to 3D visual work instructions
- Publish visualizations to make them available to global stakeholders and applications for manufacturing, maintenance, and service

Digital Twin Insights from Operations



The best engineers are always striving to improve products. SAP Enterprise Product Development supports a digital twin insights process that engineers can use to analyze operational data to identify and test design upgrades.

With SAP Enterprise Product Development, you can:

- Use IoT data in product development and create product feedback based on operational data
- Connect sensor data with physics-based simulation models that offer advanced engineering insights
- Define and manage rules so they automatically create alerts and send notifications to SAP S/4HANA, based on emerging issues
- Support integration with SAP Asset Intelligence Network, enabling handover of engineering simulation models
- Enable integration with asset management solutions from SAP, supporting better asset maintenance decisions



Define



Develop



Deliver

Digital Twin Monetization



In asset management, using digital twins with the IoT enables efficient predictive maintenance processes. The monetization of digital twins for predictive maintenance scenarios offers product managers the opportunity to increase recurring product revenues through innovative subscription-based business models. SAP Enterprise Product Development supports a digital twin monetization process that helps your product teams increase recurring product revenue, reduce risk, and lower costs.

With SAP Enterprise Product Development, you can:

- Create new business models based on time-based subscription and pay-per-use approaches
- Provide access to engineering models and monetize them based on model-exchange standards
- Support integration with the SAP Subscription Billing solution, helping you automate billing activities in SAP S/4HANA
- Help asset users provide product feedback and improvement requests to your team
- Support integration with SAP Asset Intelligence Network, helping you manage product authorizations in the business network

Visual Product Lifecycle Analytics

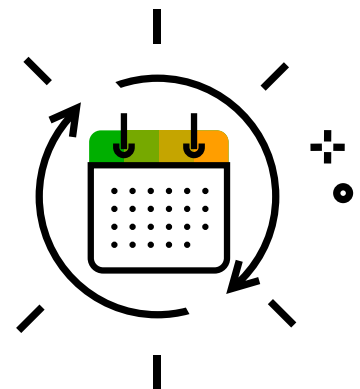


Product managers can shorten the new-product introduction process by gaining access to product lifecycle insights from new and legacy product master data. SAP Enterprise Product Development supports a visual product lifecycle and asset analytics process that helps you make this data available from design to service – supporting key business decisions with data, insights, and actions.

With SAP Enterprise Product Development, you can:

- Import 2D raster and vector data, 3D CAD product data, and 3D building information modeling (BIM) ISO 16739 data
- Author and tag 2D visualizations with hot spots, connecting enterprise master data from design to operations
- Associate 3D product visualizations and 3D BIM visualizations with enterprise master data, from design to operations
- Annotate and animate 3D visualization content
- Publish 2D and 3D visualizations, making them available across the enterprise

Help your product teams increase recurring product revenue, reduce risk, and lower costs with a digital twin **monetization** process supported by SAP Enterprise Product Development.





Define



Develop



Deliver

2D Visual Navigation

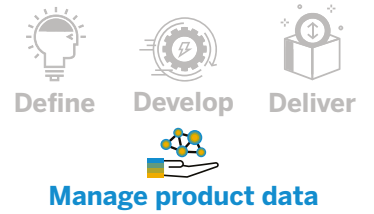


To reduce downtime of critical assets, maintenance technicians want to make timely decisions based on operational data. When repairs are needed, technicians need to quickly locate and identify key assets and gain insight into the operational environment where they will perform maintenance tasks. SAP Enterprise Product Development supports a 2D visual navigation process that helps your team quickly access operational data for key assets, plants, and buildings.

With SAP Enterprise Product Development, you can:

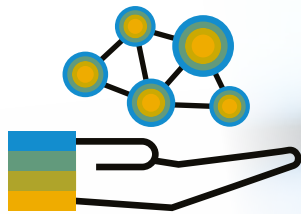
- Import 2D raster and 360-degree panoramic images
- Drag and drop 2D and 360-degree panoramic images to quickly create interactive navigation links and virtual tours
- Drag and drop 2D mapped symbols, linking enterprise technical data such as hierarchies of locations, equipment, and spare parts
- Preview predefined card templates to validate locations, equipment, and spare parts while displaying parts properties
- View 2D navigation within a predefined template and access the relevant location, equipment, and spare parts information

Manage Product Data Across the Digital Thread

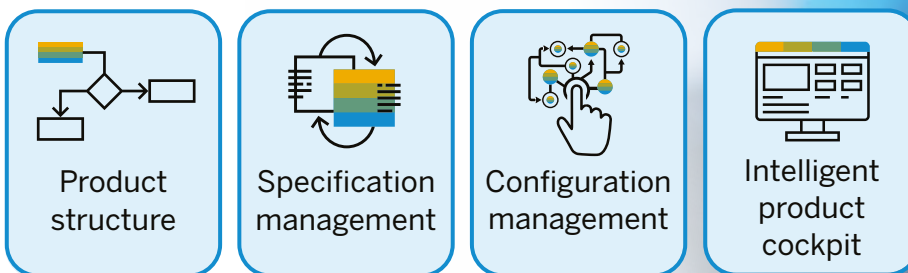


With SAP Enterprise Product Development, you can gain critical insight that helps you manage and analyze product data across the extended enterprise (see Figure 6). SAP plans to develop support for product data management processes that enable the digital thread. New software functionality may support product structure, specification management, and configuration management as well as an intelligent product cockpit.

Figure 6: Planned Support for Product Data Management Processes by SAP Enterprise Product Development



Manage product data



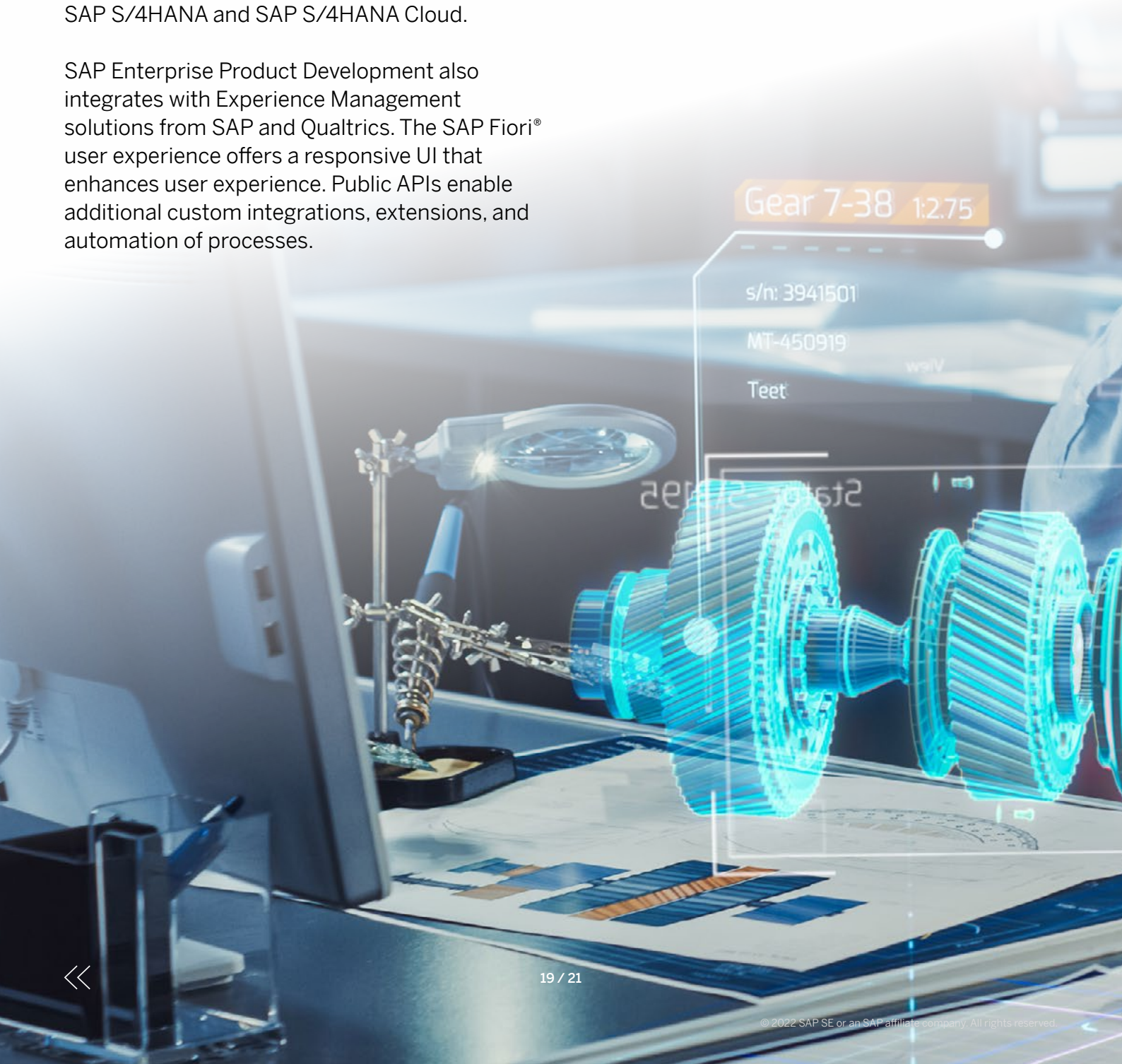
*Shaded tiles indicate planned future functionality.

Deployment Considerations for SAP Enterprise Product Development

SAP Enterprise Product Development is deployed in the cloud and is available as software as a service, so you can access your software from any Web browser.

It is a native cloud solution built on SAP Business Technology Platform. The solution comes with prebuilt integration to software such as SAP S/4HANA and SAP S/4HANA Cloud.

SAP Enterprise Product Development also integrates with Experience Management solutions from SAP and Qualtrics. The SAP Fiori® user experience offers a responsive UI that enhances user experience. Public APIs enable additional custom integrations, extensions, and automation of processes.



Review Other Resources

Find Out More

SAP Enterprise Product Development helps you digitalize product development organizations across the extended enterprise. The solution can help you achieve business value by:


- Innovating on new products through developing intelligent and sustainable products
- Providing actionable information through enterprise collaboration and sharing relevant information and insights with stakeholders
- Empowering the enterprise through closed-loop enterprise processes that synchronize the digital thread from design to operate and design to consume

Click [here](#) to learn about our free trial.

Review the [road map](#) to learn more about our plans for SAP Enterprise Product Development.

To find out more about SAP Enterprise Product Development, visit the [Web site](#) Or check out [our upcoming global events](#) or SAP solutions for use in the supply-chain line of business.

SAP partners can find more information on the [SAP PartnerEdge® site](#).



The SAP Enterprise Product Development solution helps **digitalize** product development in the cloud by connecting products, processes, people, and insights.

Quick Facts

Summary

The SAP® Enterprise Product Development solution helps you define, develop, and deliver intelligent and sustainable products by creating an ever-evolving design-to-operate value chain – enabling product development based on customer behavior and needs. With this solution, you can feed data from various sources – such as customer feedback, sensors, and SAP S/4HANA® – back into product development in a closed loop. The solution links product development teams with downstream operations across the extended enterprise for an ongoing collaborative product innovation process.

Objectives

- Create a digital thread across the extended enterprise
- Access visibility to market demand, product feedback, market requirements, and business information
- Compress the idea-to-product cycle, enabling faster innovation and time to value while reducing costs and decarbonizing products
- Deliver innovative digital services to drive after-sales and customer satisfaction
- Analyze products in operations with insights from the Internet of Things and machine learning tools

Solution

- Support for requirement-driven product development processes
 - Support for collaborative product development processes across the extended enterprise using product data
 - Visual digital thread from design to operate
 - Enablement of Industry 4.0 in the product lifecycle
-

Benefits

- Enhanced ability to innovate by developing high-quality, compliant, and sustainable products with a single source of information for data consistency and straightforward access to information
 - Increase in actionable information through enterprise collaboration, sharing relevant information and insights with stakeholders
 - Greater enterprise empowerment by digitalizing product development, creating closed-loop processes that synchronize the digital thread from supply chain to the business and from design to operate and design to consume
-

Learn more

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