Visualizing and validating product designs across your extended enterprise

eds.com/plm

Teamcenter Visualization

To maximize your products' innovative content, you need a collaborative environment where breakthrough ideas can be freely suggested, discussed, evaluated, tested, reviewed, and transformed into tangible product definitions.

EDS

Today's market leaders understand that product innovation is going to increasingly determine their competitive effectiveness.

Over the last ten years, market leaders have leveraged technology initiatives such as design automation and product data management to accelerate their time-to-market and minimize their product cost.

But as these initiatives become commonplace, technological parity is expected to take place. Once this occurs, product makers may be forced to compete on the basis of price – unless they are able to differentiate themselves with new advantages.

With the dawn of the new millennium, leading product makers intend to increase their market size by delivering breakthrough features that distinguish their products in a crowded marketplace.

Simply put, they expect to establish competitive advantage by introducing innovative product content that captures their customers' imaginations and makes their product offerings easier to sell.

But competing on the basis of product innovation is easier said than done. You need to:

- Develop your innovations at a reasonable cost.

- Introduce new content ahead of the competition.

- Make certain that your breakthrough features comply with quality standards.

To enable you to meet these strategic objectives, EDS offers Teamcenter Visualization – a collaborative solution that optimizes the early stages of the product lifecycle, which are crucial to product innovation.

During the early stages of the product lifecycle, new product ideas need to be freely suggested, discussed, evaluated, initially tested, reviewed, and refined.
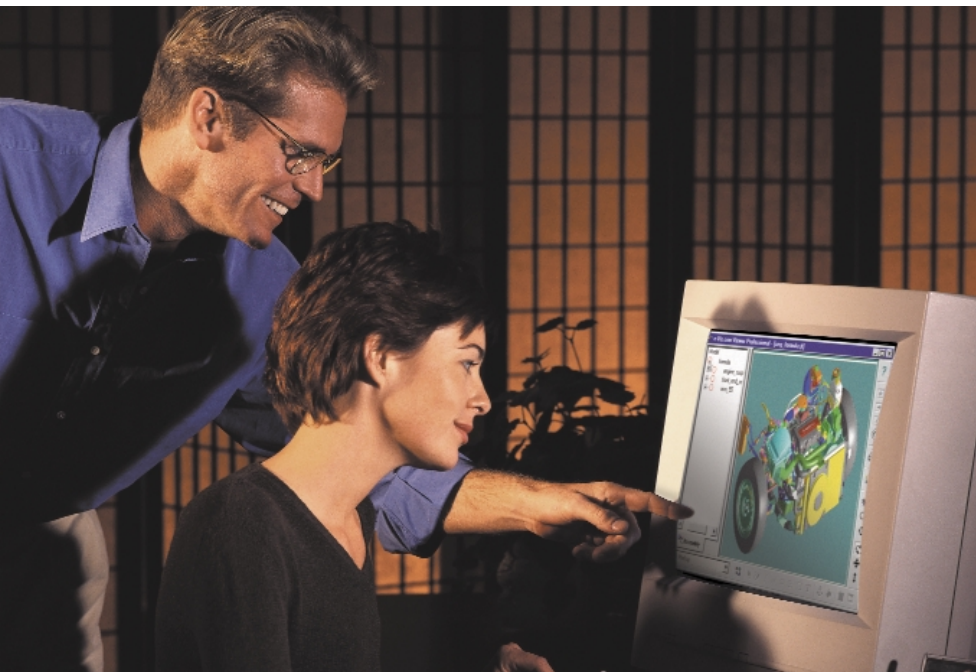
Teamcenter Visualization enables you to establish a CAD-neutral environment that enterprise teams can use to brainstorm, turn product ideas into tangible design concepts, and turn conceptual works-in-progress into stable product definitions.

Teamcenter Visualization is especially adept at liberating product knowledge beyond the confines of your engineering domain. In essence, Teamcenter Visualization crystallizes your product knowledge and makes it understandable to downstream participants in your product lifecycle, including your manufacturing, maintenance, and customer service specialists.

Teamcenter Visualization provides a wide range of capabilities that enable engineering and manufacturing teams to quickly visualize and validate your product innovations. Design validation allows you to maximize product quality – and minimize your warranty costs – while ensuring that your design innovations can be manufactured to meet your cost and delivery objectives.

"The payback from visualization… is both high and immediate. Digital mockup and animation are just beginning to have a substantial impact in end user applications, as (visualization) products become easier to use and (able) to read more CAD file formats."

CIMdata

Teamcenter Visualization's business value

Teamcenter Visualization enables enterprise teams to synchronize their engineering and validate their product designs while leveraging their current CAD and PDM investments.

Customer

Partner

Marketing

Supplier

Engineering

Manufacturing

The Teamcenter Visualization Advantage

Established market leader

High-end digital mockup

Open CAD and PDM

Applications breadth

Teamcenter Visualization's innovation-driven capabilities enable you to accelerate the introduction of new products, increase your market share, and capture new market segments.

To establish these competitive advantages, your take to market teams can leverage Teamcenter Visualization to:

• Implement collaborative processes that slash your cycle times, foster product innovation, and minimize your institutional risk.

• Adopt system engineering techniques and design reviews that reflect the diversity of your extended enterprise, while meeting the quality and delivery requirements of your customers and prospects.

• Synchronize product information and process implementation across your entire enterprise to compress your product lifecycle.

• Leverage a breadth of innovation solutions to eliminate inefficiency through all of your lifecycle stages.

• Eliminate the communications and collaboration barriers that accumulate when your engineering systems are isolated from the rest of your enterprise.

Teamcenter Visualization is a crucial solution in EDS' market-leading portfolio of Teamcenter product lifecycle management solutions.
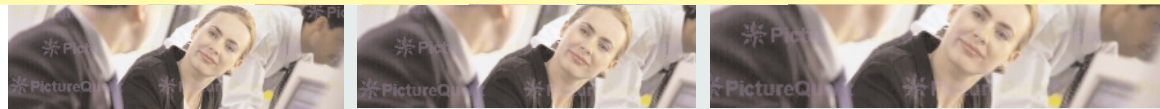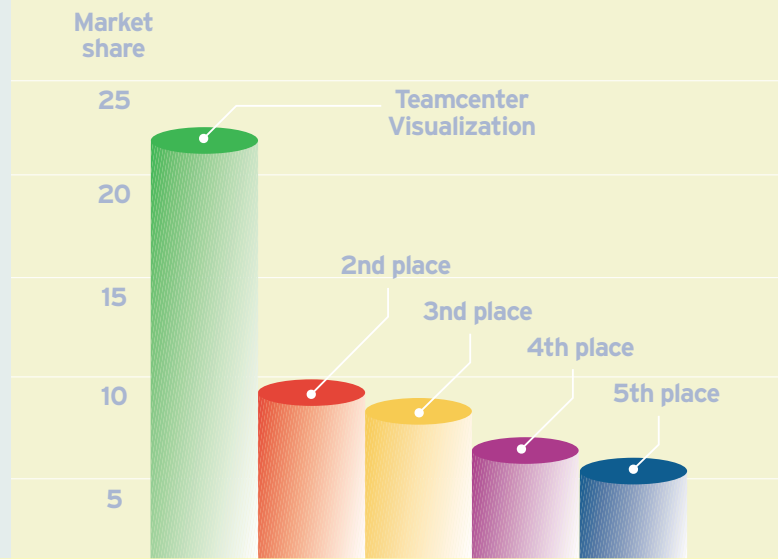
Teamcenter Visualization allows everyone in your take to market chain to visualize your product decisions and voice their concerns as early in the product lifecycle as possible.

Teamcenter Visualization Benefits

Benefit	Advantage
Taps into your value chain's most creative talent	Teamcenter Visualization allows your own globally dispersed organizations – as well as your suppliers and allied partners–to freely collaborate in enterprise teams without regard to geographic, organizational, or technical boundaries.
Accelerates product development	Teamcenter Visualization enables downstream members of your value chain to participate in your earliest design decisions, visualize the impact of these decisions, and voice their concerns before expensive rework needs to be performed.
Reduces development costs	Teamcenter Visualization allows design teams to validate suggested product innovations in virtual prototypes that can be created, shared, reviewed, and tested on an enterprise basis.
Introduces new voices/ perspectives into your product lifecycle	Teamcenter Visualization enables all entitled participants in your product lifecycle–including non-traditional participants such as marketing representatives, customers, prospects, and focus groups–to experience your product innovations in virtual reality settings.
Improves product quality	Teamcenter Visualization allows you to implement a comprehensive quality management process and related product/process model that you can use to identify, analyze, and correct production build problems before they impact downstream stages in your product lifecycle.
Maximizes re-use of your product information	Teamcenter Visualization enables you to leverage your enterprise's existing product and process information in documents that you can distribute on an enterprise basis.

Established market leader

Teamcenter Visualization is far and away the market leader in product visualization with more market share than the next three competitors combined.

Market share

Teamcenter Visualization

2nd place

3nd place

4th place

5th place

25

20

15

10

5

Teamcenter Visualization leverages .JT, the proven low-risk industry standard for allowing users to work with easily exchangeable CAD-neutral files.

"(EDS PLM Solutions) continues to lead this segment and its technology is used by a growing number of companies, including many of (EDS') competitors."

CIMdata

Teamcenter Visualization is the leading product visualization solution in the world, with more than twice the market share of its next competitor – and more market share than the next three competitive solutions combined.

With nearly 200,000 seats in production, Teamcenter Visualization is used by more people in more companies than any product visualization solution in the world.

Teamcenter Visualization's core technology has become the industry standard for product visualization. EDS' commitment to open standards is illustrated by the use of Teamcenter Visualization toolkits in many of today's most prestigious product data management (PDM) systems–as well as their use in numerous industry-specific business-to-business exchanges. Even EDS' competitors license Teamcenter Visualization's core technology.
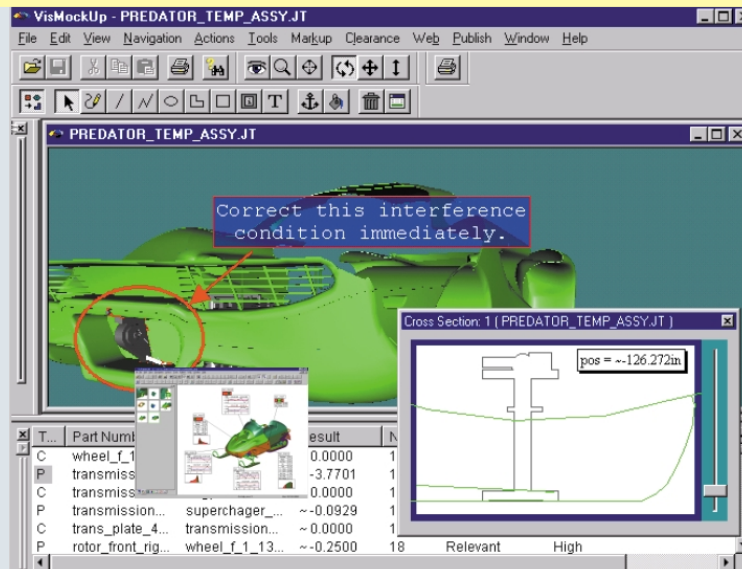
Teamcenter Visualization leverages industry standard .JT technology to allow users to work with CAD-neutral files that can be easily exchanged on a global basis–without having to know how to use any CAD software.

Teamcenter Visualization's marketplace success provides a no-risk alternative for companies that are looking to implement a solution built on proven technology. Teamcenter Visualization has demonstrated its credentials over and over again in real-world settings.

The suppliers and allied partners that work in your value chain are more likely to be using Teamcenter Visualization than any product visualization solution available today. Teamcenter Visualization's standard-based foundation ensures that your visualization investment can be extended and protected over time.

High-end digital mockup

Enterprise teams can use Teamcenter Visualization to mock up high-level virtual prototypes comprised of thousands of parts and components. Teamcenter Visualization users employ powerful evaluation tools to perform fly throughs, interference checks, product simulations, and ergonomic tests.

As product innovations evolve during the early stages of the product lifecycle, design teams need to crystallize their design decisions and test the validity of these decisions before stabilizing the product definition.

Traditionally, design teams built physical prototypes to evaluate different design approaches and validate their respective feasibility. However, the iterative nature of product design and the expense of physical prototyping are two reasons why many companies historically have been reluctant to compete on the basis of product innovation.
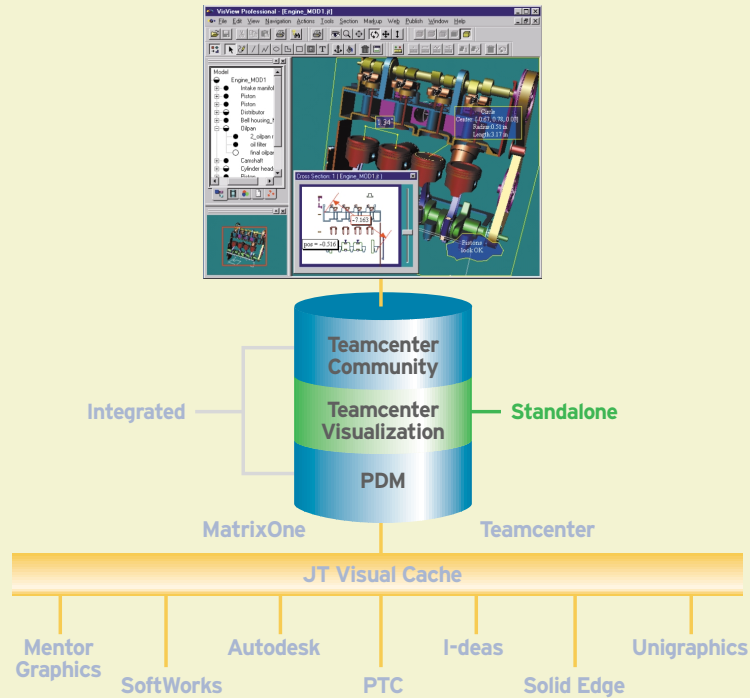
Teamcenter Visualization addresses these concerns by incorporating virtual prototyping into its array of capabilities. Virtual prototyping is a cost effective alternative to physical prototyping that generates enormous savings for today's product makers.

Teamcenter Visualization's digital mockup capabilities enable you to create virtual prototypes comprised of thousands of parts and components. These virtual prototypes let you minimize – and in some instances eliminate – expensive physical prototyping as a means of validating your design concepts.

Once you mock up your product's components into a high-level virtual prototype, you can use Teamcenter Visualization's powerful evaluation tools to "fly through" the prototype, check for interferences and clearances, and simulate its assembly, maintenance, and ergonomic use.

Teamcenter Visualization's open architecture enables you to take designs created under multiple CAD systems and managed under different PDM systems, and integrate them into high-level product views.

Teamcenter Visualization's open solution allows all of the participants in your extended enterprise to continue to leverage their current CAD and PDM investments.
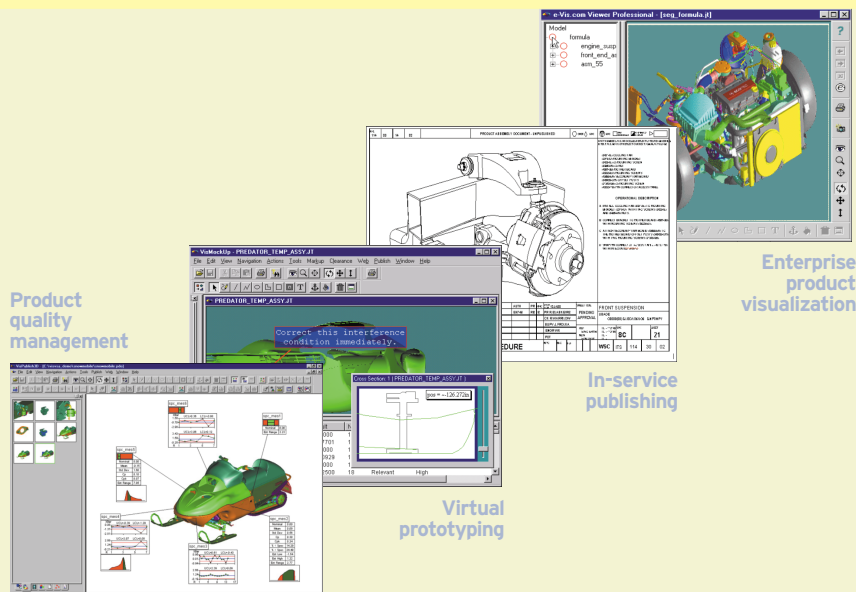
Teamcenter Visualization leverages a completely open architecture that enables you to integrate the world's leading CAD and PDM systems into your collaborative solution. Teamcenter Visualization transcends issues that frequently arise when companies try to get widely dispersed design team members to work together effectively in an enterprise setting.

Teamcenter Visualization enables you to take part/component designs created under dissimilar CAD systems and integrate them into higher-level product views. Teamcenter Visualization allows you to combine these high-level product views with product definitions that you maintain in PDM systems to create a visualized high-level product definition.

Individual designers and engineers continue to employ their CAD and PDM systems of choice to design, define, and manage lower-level components. Bottom-line benefit: you retain the personal productivity delivered by your current CAD/PDM investments.

When you need to evaluate or review a product in its entirety, you can use Teamcenter Visualization to "release" high-level product definitions to your extended enterprise. Bottom-line benefit: you enable all of the entitled users in your extended enterprise to access and leverage your visualized product innovations in their entirety as early in your product lifecycle as possible.

Teamcenter Visualization is a high-level solution that encompasses the industry's widest breadth of visualization applications, including capabilities for product visualization, design review, virtual prototyping, quality management, publishing, and virtual-reality conceptualization.

Enterprise product visualization

In-service publishing

Virtual prototyping

Product quality management

EDS can configure Teamcenter Visualization's underlying capabilities to deliver a tailored solution that addresses your enterprise needs.

Teamcenter Visualization provides the industry's most robust and comprehensive breadth of underlying applications, including capabilities for:

• Enterprise product visualization

• Design review

• Prototype build and validation

• Product quality management

• In-service publishing and maintenance

• Product conceptualization

Enterprise Product Visualization. Teamcenter Visualization provides lightweight visualization capabilities to enable product teams outside your engineering and manufacturing domains (including marketing participants and executive management) to collaborate and understand the evolution of your product innovations across the product lifecycle. Enterprise teams can more effectively participate in the early stages of product development, eliminating miscommunications and rework that are incurred if product teams fail to align their product assumptions.
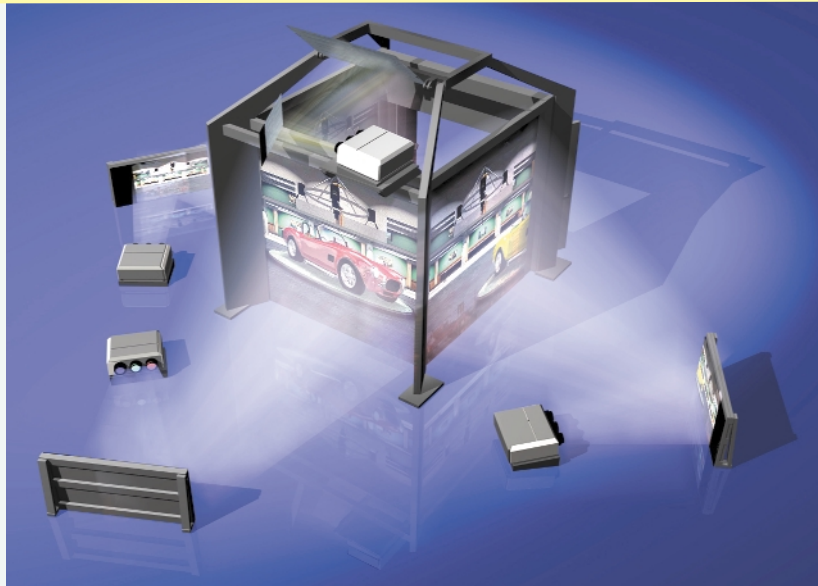
Design Review. Teamcenter Visualization enables design teams to quickly pull multi-CAD designs together in a single environment that facilitates complex product innovation.

Teamcenter Visualization allows team members to raise and document product-related issues, validate design innovations against corporate standards, test the validity of iterative design concepts, and optimize the design review/approval process.

Prototype Build and Validation. Teamcenter Visualization enables design teams to digitally mock up a product in its entirety. Engineering and manufacturing teams can quickly evaluate design alternatives, evaluate design changes in terms of their feasibility, and determine the impact that design decisions will have on the downstream stages of the product lifecycle. Taken together, these digital mockup capabilities allow you to compress your development cycle while reducing your need for expensive physical prototypes.

Product Quality Management. Teamcenter Visualization enables you to build a comprehensive product/process model that represents your products' design geometry, tolerances, assembly attachment methods, and assembly sequence measurements. Teamcenter Visualization allows you to identify production-build problems before they occur, predict the root causes and amounts of variation, and optimize product tolerances and your assembly processes.

Teamcenter Visualization's product conceptualization capabilities enable users to evaluate product innovations in virtual reality settings.

Teamcenter Visualization's virtual reality capabilties enable you to inject the voice of the customer, marketing/sales concerns, and focus group opinions into your new product designs.
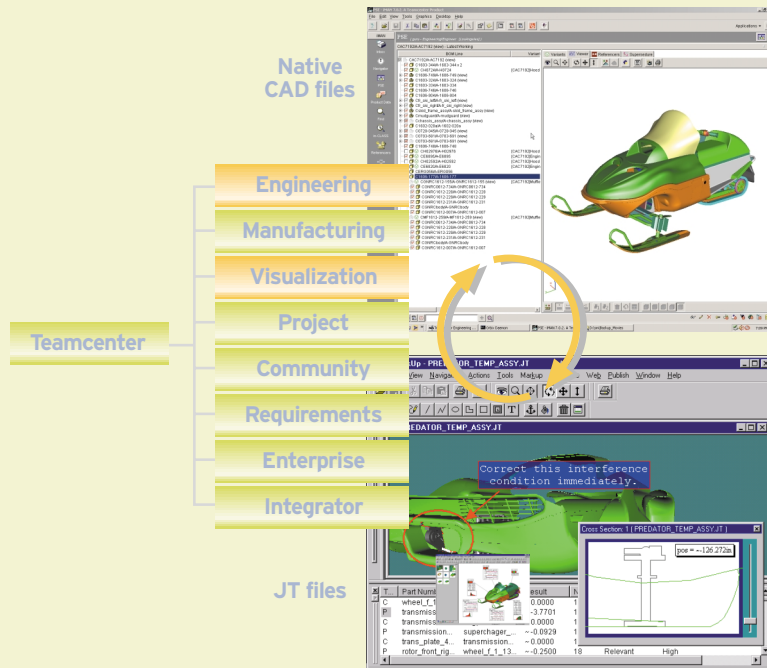
In-Service Publishing and Maintenance. Teamcenter Visualization allows you to re-use the product information that you generate during the early stages of your product lifecycle. Teamcenter Visualization enables you to automate the process you use to document your products while providing in-service teams with digital product instructions (including animations).

Teamcenter Visualization lets you capture dissimilar graphics files (including 2D multi-CAD drawings, 3D models, documents, PDFs, sound clips, and movie clips) and integrate them into re-useable illustration sheets. You can publish and distribute these integrated illustration sheets in hardcopy documents, Web pages, and universally viewable files. Your in-service teams can take advantage of these capabilities to make certain they are working from the most recent service instructions/bulletins.

*Product Conceptualization.*Teamcenter Visualization's virtual reality capabilities allow take to market teams to evaluate new product concepts in full scale. Customer focus groups and internal reviewers can interact with high-resolution, photo-realistic images on large screens up to eight feet tall. This enables you to maximize the marketability of your products by making certain that your product innovations meet customer expectations and reflect consumer preferences.

Teamcenter Visualization's robust capabilities provide all of the functionality that your extended design teams need to maximize your products' innovative content and streamline the conceptual design phase of your product lifecycle.

Teamcenter Visualization's seamless integration with Teamcenter Engineering enables design teams to synchronize their visualizations and product mockups with native CAD files and other product information in an engineering bill of material (BOM). Teams leverage this integrated BOM to streamline the automated process they use to digitally validate their designs on a repeatable basis.

Key Teamcenter Visualization Capabilities

Capability	Advantage
CAD-neutral visualization	Enables members of enterprise teams to visualize product-related design data in an Internet environment without needing to install or use a CAD system.
Multi-CAD environment	Allows your enterprise to leverage its current CAD investments while integrating multi-CAD designs across your value chain.
View and markup	Captures the concerns of dispersed team members and shares them on an enterprise basis.
Cross-section, measurement, and clearance detection	Validates your product innovations to make certain they met design and quality requirements while minimizing engineering change orders.
Animation and fly through	Enables you to simulate/verify product fit, form, and function while minimizing product change and validating manufacturing layout and planning.
Flow charting	Allows you to plan and model product-related manufacturing processes while minimizing manufacturing cost.
Variational analysis	Improves product fit, increases product quality, and reduces manufacturing/ warranty costs.
Digital publishing and animation	Automates the creation of downstream product documents while providing in-service teams with up-to-date digital service manuals and animations; reduces shop floor rework while increasing customer satisfaction.
2D and 3D translators	Supports a broad array of information formats (e.g., documents, graphics, and 2D drawings) and 3D CAD/CAM/CAE files; enables you to leverage all of your product knowledge across your entire value chain.
Virtual reality evaluation	Enables you to make certain that your product innovations comply with customer expectations; also allows you to reduce your need for physical prototyping.

About EDS

EDS, the leading global services company, provides strategy, implementation and hosting for clients managing the business and technology complexities of the digital economy. EDS brings together the world's best technologies to address critical client business imperatives. It helps clients eliminate boundaries, collaborate in new ways, establish their customers' trust and continuously seek improvement. EDS, with its management consulting subsidiary, A.T. Kearney, serves the world's leading companies and governments in 60 countries. EDS reported revenues of $21.5 billion in 2001. The company's stock is traded on the New York Stock Exchange (NYSE: EDS) and the London Stock Exchange. Learn more at **eds.com**.

About product lifecycle management solutions

EDS is the market leader in product lifecycle management (PLM), providing solutions to the global 1000. Product lifecycle management enables all the people who participate in a manufacturer's product lifecycle to work in concert to develop, deliver, and support best-in-class products. As the only single-source provider of PLM software and services, EDS can transform the product lifecycle process into true competitive advantage, delivering leadership improvements in product innovation, quality, time to market, and end-customer value.

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