

Unigraphics® Total Product Engineering

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Embracing the 21st century in stride, virtually all manufacturers have adopted some form of computer-aided design, engineering and manufacturing technologies. These same manufacturers believe that they can get and stay ahead by continuously introducing new products that are differentiated by the latest technological advances, innovative designs, higher functionality and superior quality.

To gain and keep a competitive edge in today's economy, you must employ the most advanced tools and processes available. Tools and processes that will allow you to engineer and produce high-quality, competitive products in the shortest time possible.

But how do you know which technology solution to choose for product development? Today's tools range from narrowly focused, inexpensive solutions to enterprise-level solutions tipping the scales in price and function. With this wide range in choices, it is critical that you select the best solution. The ability to model a product has become the common core competency of most of these systems, which may suggest that all solutions are very similar in capabilities. In fact, at first glance, you might believe that the differences among the most popular solutions has been reduced to the price and distribution channel. This could not be further from reality.

Although the past few years have seen the rise of 3D solid modeling systems, the focus of most systems has been primarily on the design and drafting areas of product development, with a specific concern for designer productivity. However, complete product lifecycle productivity – getting from concept through design through manufacturing as efficiently as possible – should be the criteria for your solution choice. The best technology should enable you to integrate your expert knowledge and your company's unique best practices with advanced CAD/CAM/CAE and collaboration software. This ultimately results in a solution that can help you deliver an unmatched competitive advantage.

The key then is to make sure that the solutions you choose are in fact the most advanced solutions available. Settling for second best usually results in a company's products also being second best, or worse.



A total product engineering solution

EDS' Unigraphics delivers Total Product Engineering – modeling and validating your products and their production processes digitally

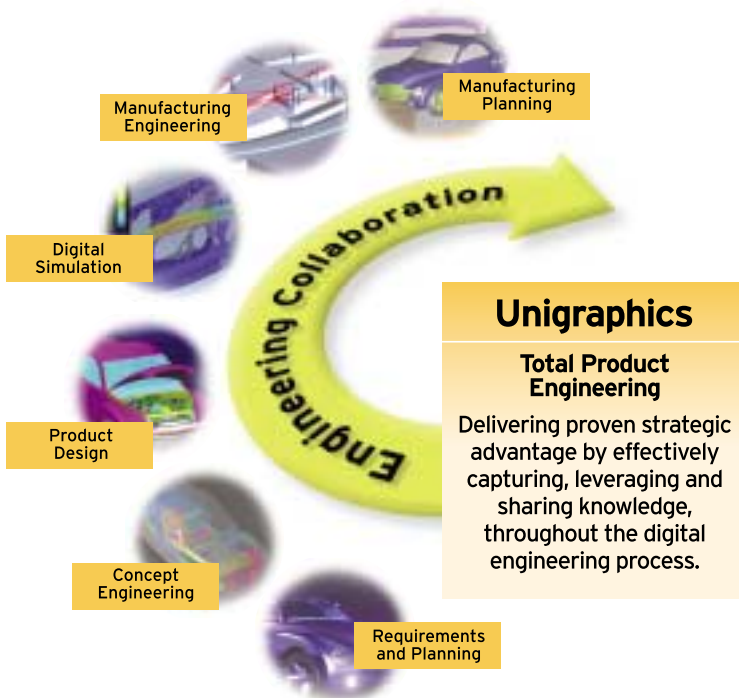
Introducing Unigraphics Total Project Engineering

EDS' Unigraphics® delivers Total Product Engineering - modeling and validating your products and their production processes digitally. Unigraphics addresses your virtual product and process development requirements, delivering a solution with proven production value. With Unigraphics, your designers and engineers will discover a new way of approaching product development. Rather than being limited to geometry manipulation, your team can develop products directly from engineering requirements.

Unigraphics provides a proven strategic advantage by effectively capturing, leveraging and sharing your knowledge throughout the entire digital engineering process. To ensure your success Unigraphics delivers:

- *Knowledge driven automation*, which enables you to capture process knowledge and use it to automate the product development process.
- *System-based modeling*, which enables re-use of engineering information across very complex products.
- *Integrated collaboration*, which leverages the innovation of all members of the product development team.
- *Openness by design*, which integrates the supply chain through seamless communication of information.
- *Production-proven applications*, which integrate the complete engineering lifecycle from concept through manufacture.

From initial concept to finished part, Unigraphics enables electronic communication and collaboration for complete digital product development. Unigraphics enables you to fully document and communicate all of your product attributes in an innovative, interactive, and understandable environment. Because of its unequalled depth of integration, Unigraphics makes it possible for you to create, simulate, optimize, document, build, and test your products in record time – all within an integrated digital environment.



The Unigraphics difference



Process-based design Wizards, knowledge-embedded models, alternative modeling methodologies, open architecture and collaborative engineering tools are just a few of the unique technologies that Unigraphics leverages to bring higher levels of quality, productivity and innovation.

Knowledge driven automation

Simply stated, knowledge driven automation (KDA) is all about capturing process knowledge and using it to automate the product development process. Technology is about the way systems work. Processes and practices are about the way people work. Combining the three (processes, practices and technology) to achieve the success our customers are looking for is paramount.

Capturing and re-using knowledge is a key characteristic of Unigraphics. It reflects our commitment to protect our customers' investments in research, design, production and personnel. How we apply knowledge to automation sets us apart from everyone else. KDA is a revolutionary suite of tools for making knowledge capture not just possible, but efficient, practical and powerful.

KDA allows you to reduce cycle times by automating repeatable segments of the engineering

process and enabling less experienced engineers to solve complex problems.

System-based modeling

With parametric modeling, you can look at a part in many different shapes and sizes by simply changing its dimensions. With system-based modeling, you can look at the entire product and its production processes in many variations by changing any of its parts.

Manufacturers design assemblies, subassemblies and components in addition to parts. Unigraphics technology elevates parametric modeling techniques to a higher-level, system and product design. System level design parameters are driven down through the product to its subsystems, subassemblies and ultimately to the components themselves. Changes in the product definition template are therefore rippled through all affected systems and components in a controlled and automated way.

Integrated collaboration

Manufacturers build products, usually as the result of a collaborative effort involving many people. Unigraphics includes all the technologies that enable you to involve your extended development team, your customers and your supply chain in the product development process.



Openness by design

Unigraphics is open to work with other CAD systems, and even provides the foundation technologies that are used by other computer-aided tools so you can readily exchange data with whoever is involved in the process. Unigraphics extends the ways in which you capture your design by allowing you to directly apply geometric rules and constraints to all models, regardless of their origin. It also provides much more flexibility to combine whichever modeling methodology suits your particular working environment or the job at hand.



Production-proven applications

From concept design through manufacturing, Unigraphics offers an unsurpassed depth of integration and functionality. By integrating our customers' best practices and processes with advanced CAD/CAM/CAE software, Unigraphics offers best-in-class solutions for each area of the product development lifecycle. Today, thousands of customers – global leaders in markets from automotive to consumer products – are

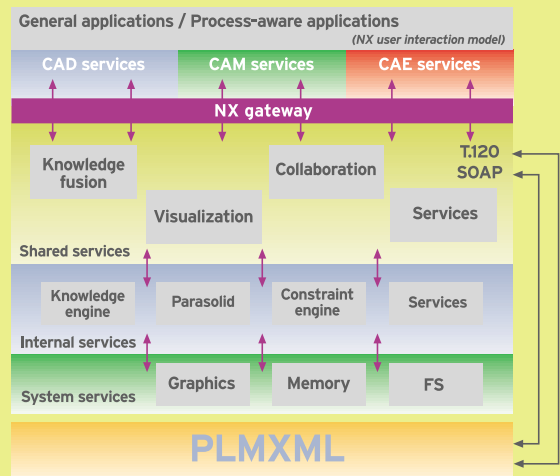
proving its value by developing high-quality, innovative products and bringing them to market faster than their competition.

Unigraphics NX: next generation architecture for product lifecycle management

Unigraphics NX is a new PLM-enabled architecture based on the latest industry standards. In conjunction with our leading customers, EDS has designed a state-of-the-art architecture that uniquely enables total product engineering.

Unigraphics NX delivers:

- A core platform built on industry standards that power knowledge-enabled applications. This innovative architectural design allows users to move beyond simple process automation, enabling quick and easy development of engineering process-specific applications.
- A new user interaction model specifically designed to support highly productive process-oriented workflows. The intelligence of the software infers the correct action to take giving the user an opportunity to concur or alter the inference.
- The NX gateway, providing a new level of interoperability for associative integration. Built on PLMXML, the NX gateway provides associative interoperability, enabling organizations using EDS' CAD/CAM/CAE or third party applications to directly exchange and re-use design information. This interoperability reduces data exchange costs and associated data integrity problems.
- A foundation of industry standards, including standards and protocols for real time design collaboration, accurate and open interoperability, visualization and interrogation, and network addressable knowledge services and integration with other industry web services.



Unigraphics NX architecture

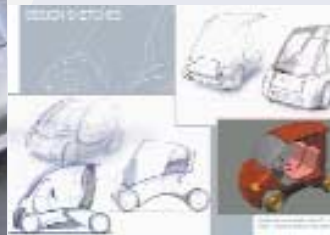
Concept design



Turn concept into reality
To succeed in today's competitive global marketplace, you need forward-thinking concepts, and you need to get them to market fast. You need outstanding design tools that convert visionary ideas into real products quickly and accurately. You need stylists, designers, tooling and manufacturing personnel all working collaboratively on the same product at the same time. The conceptual design process involves much more than just art and appearance. It includes consideration of the function and value of the product, and technical issues such as requirements for manufacture.

Unigraphics is the only industrial design solution that is integrated with a product modeling system. It delivers unparalleled freeform and styling capabilities to create breakthrough designs and enables downstream production and manufacturing personnel to work on the same model at the same time. Your concept models can be shared in areas such as assemblies, drawings, manufacturing and simulation, through embedded knowledge and attributes in the system. The design is fully associative, which means as the model changes, downstream applications are able to update the design in their work area, but not lose application data already created.

Unigraphics allows designers the freedom to develop new concepts while working in an environment that encourages collaboration with the downstream activities such as mechanical design, tool design and manufacturing. Your designers have complete freedom to express, explore, innovate and visualize while expressing practical concern for technical processes and requirements. Your organization can more effectively optimize the function, value and appearance of your products.



Product design

Leading design modeling capabilities

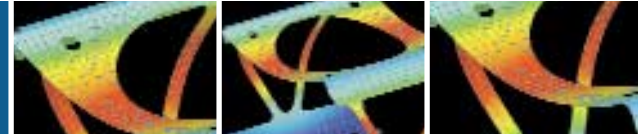
Unigraphics delivers the engineering control and flexibility combined with the ease of use you need to design faster than any other system on the market. With Unigraphics, designers are not constrained by rigid CAD procedures. They can use whatever methods they need for the task at hand, including parametric modeling, solid modeling or surface modeling methodologies.

Unigraphics provides knowledge-driven design capabilities, enabling you to capture the important engineering rules and criteria, and apply them to automate the design process. The engineering intent of the design is preserved and remains when design changes are applied. Leading dimensional management tools are available to predict and eliminate manufacturing/assembly line problems, thus ensuring a quality product that goes together smoothly on the shop floor.

Unigraphics enables you to design and evaluate parts in the context of the overall product, regardless of how complex it may be. By working in this higher-level product design context, you can design parts that are fit for purpose at the assembly or product level. In addition, different designers and engineers are able to work on the different parts, components and subassemblies within the product at the same time. This means that changes made by the individual people working on the product are immediately captured and available for all to see.



Digital simulation



Analysis-guided designs

Developing exceptional products that meet strict quality and performance criteria cannot be left to chance. Unigraphics takes the guesswork and worry out of your product development with a powerful integrated digital simulation solution. Design it right the first time and make your competitors worry, not your employees and customers.

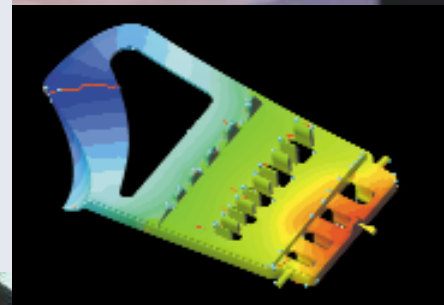
Wizard-based simulation tools such as the Strength Wizard provide specific process guid-

ance at every step throughout a simulation. These tools encapsulate expert analysis knowledge so that it can be used by the non-specialist designer in the earliest stages of the design process. The designer can use these sophisticated simulation tools to quickly determine whether the design will work, and to evaluate the impact of design changes.

Simulation driven design

Unigraphics provides the in-depth simulation and analysis tools that allow you to define the most productive process to evaluate and validate the performance of new products, regardless of the source of the CAD data. Unigraphics accelerates the process of building high quality FE models appropriate for the type of analysis required – stress, durability, dynamic response, optimization, thermal or motion.

Most importantly, the Unigraphics design environment manages your CAE models and results in association with the product design geometry. This enables close collaboration within your engineering teams as well as with your suppliers.



Digital manufacturing

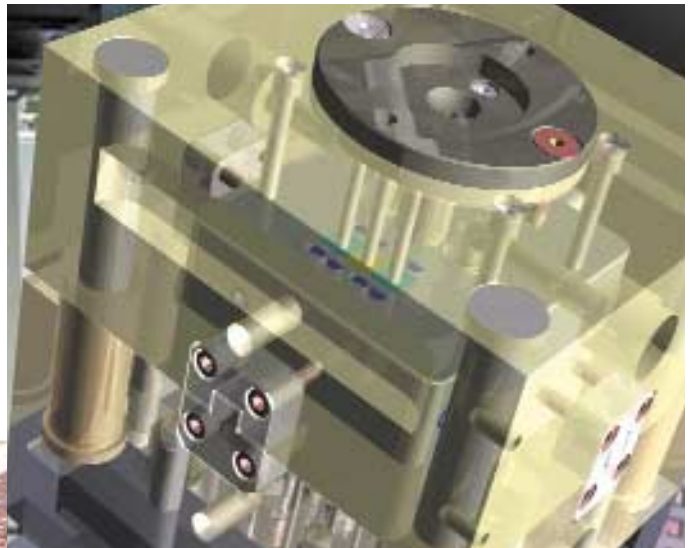
Knowledge-driven manufacturing

Manufacturing is where everything comes together. It is the ultimate test of your ability to execute. Accuracy and quality are paramount because even small delays can cost large amounts of money. Yet how much time is wasted experimenting with prototypes to achieve machinable designs? How much productivity is lost maintaining multiple systems for different machining processes?

Unigraphics delivers a single manufacturing solution capable of machining everything from holes to wire EDM to full 5-axis milling. In-process models, process planning and optimization and tool management are all linked directly to the master design to ensure your productivity is maximized. Combine this with Unigraphics' extensive customization and process capture capabilities, and you've got a compelling manufacturing solution that gets it right the first time.

Process Wizards capture the industry's specific process knowledge, promote the most efficient work flow and link complex elements of design technology into automated sequences. The productivity gains can be two and threefold, and in some cases even greater. Ironically, the more complex the process, the greater value and benefits are realized. What once was only in the minds of experts can now be easily utilized by less experienced designers. Process wizards are available that address the design of specialized tooling for manufacturing (mold

and progressive stamping dies) and deliver immediate productivity gains. Not only does Unigraphics automate these tedious processes and provide expert guidance, but it also makes design changes a breeze. Full associativity and automatic updates ensure that changes are propagated easily and instantaneously.



● ● **Unigraphics Total Product Engineering – your strategic competitive advantage**

Today's success is measured by your ability to execute, whether it be producing sketches and drawings to getting a completed product to market. The key to execution is intelligent, efficient processes. Unigraphics delivers powerful solutions to address your markets, your processes, your products. We offer capabilities that nobody else can: integrated concept design, integrated knowledge-based engineering, real-time design collaboration, and the world's best product design and manufacturing – a total product engineering solution.



Unigraphics Total Product Engineering can bring you a strategic advantage that will help you develop and manufacture higher-quality products faster and at lower cost. Unigraphics delivers industry-leading technologies that can significantly improve individual and departmental productivity in design, simulation, and manufacturing, all in an integrated, associative digital environment that addresses the entire product development cycle.

More than an integrated CAD, CAE, and CAM solution, Unigraphics Total Product Engineering delivers unique capabilities that can help you realize order-of-magnitude productivity gains. With knowledge driven automation, you can leverage industry best practices and your company's unique expertise to guide and accelerate the entire design-through-manufacturing

process. With Unigraphics unique system-based modeling, you can automatically control your product configuration as you evaluate design alternatives for assemblies, sub-assemblies, and components. And Unigraphics is complemented by unmatched collaboration technologies and an open system architecture that facilitates innovation across the extended development team and to customers and suppliers – regardless of the tools they are using.



The Unigraphics advantage

Unigraphics offers capabilities that nobody else can – integrated concept design, integrated knowledge-based engineering, real-time design collaboration, and the world’s best product design and manufacturing.

- Unigraphics is in production use at more than 18,000 companies worldwide.
- 40 percent of manufacturers in Fortune's list of "Global 500 Companies" use Unigraphics.
- Unigraphics services everything from 2- to 10-person shops, to 100-person businesses, to 370,000-person global enterprises.
- Unigraphics can leverage parts from a worldwide community of more than 1 million users of our products – all without any need for a data translator.



Complete product lifecycle solution



Unigraphics Total Product Engineering is the product development cornerstone of a complete product lifecycle management solution from EDS. For those users looking for a breakthrough system that addresses the needs of all stages in your product lifecycle – from requirements gathering through in-service support, Unigraphics integrated with EDS' Teamcenter™ is the solution.

Simply put, product lifecycle management is the ability of extended enterprises – consisting of dispersed users and diverse data types – to effectively plan, execute, monitor, and optimize all of the stages in a product lifecycle. EDS' Teamcenter is a breakthrough series of solutions that addresses the collaborative needs of all of the stages in your product lifecycle – from requirements gathering through in-service support.



Experteam™ Services

Any of these solutions can be implemented quickly and cost-effectively worldwide by EDS' Experteam professional services organization. EDS offers product lifecycle management related services to address your training, installation and implementation needs. The wide array of service offerings can further enhance the value added to your product development activities. Contact your EDS sales representative today to learn more about these solutions and their ability to turn your company's most strategic e-business initiatives into real-world results.



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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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, services 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 www.eds.com.

