

Establishing Global Innovation Networks

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white paper



- ▶ In a business environment marked by accelerating change on a global scale, companies must find new sources of innovation that extend well beyond in-house invention. To accomplish this, more and more best-in-class companies are choosing a road that leads to Global Innovation Networks.

PLM Software

Answers for industry.

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Manufacturers today are striving to achieve top-line growth while maintaining the cost reductions they've achieved in recent years. It's a delicate balance, particularly when business is increasingly global, fluid and complex. It requires that manufacturers become more adept at managing their businesses – in particular, their product lifecycles – more effectively. It demands that they look beyond traditional sources of inventions and innovations to create a sustainable competitive advantage.

“[According to our research], two-thirds of CEOs recognize innovation as one of the five most important factors required to succeed and sustain competitive advantage.... yet...most companies are able to commercialize less than one in five promising ideas, and only one in eight executives feels strongly that their companies excel at implementing innovative ideas.”

[Good Ideas are not Enough. Accenture – Research and Insights]

Revenues from new products are expected to contribute the lion's share of top-line growth. According to a recent Deloitte Research study, “Executives expect new product revenue as a share of total sales to hit 34 percent in 2007, up from just 21 percent in 1998. Over the next six years, products representing more than 70 percent of manufacturers' sales today will be obsolete due to changing customer demands and competitive offerings.” [Mastering Innovation. Deloitte Research, 2004] Clearly, manufacturers need to improve their capabilities for managing the innovation process and commercializing the best ideas, regardless of where they originate.

“Global Innovation Networks” represent a transformative business model built on collaboration that fosters innovation at every stage of the product lifecycle and every level of the value chain. It's a model that requires a digital environment that encompasses key contributors from strategic partners, suppliers and customers around the world. By creating Global Innovation Networks, manufacturers are able to meet these key business requirements that support top-line growth plus cost-containment:

Innovate more – by increasing the yield on product and process innovation to accelerate top-line growth

Reduce time-to-market – through lean processes, a higher yield on designs and faster cycle times

Ensure compliance – by incorporating customer and regulatory requirements at all stages of the product lifecycle and by automating the process of documenting compliance

Optimize resources – by gaining greater efficiency through the product lifecycle and digital product and process validation

Leverage globalization – through real-time collaboration with global partners, suppliers and customers

This paper takes a look at how manufacturers can create their own Global Innovation Networks, improving performance in several key initiatives along the way.

Increasing product revenues is critical to growth

AberdeenGroup surveyed 125 companies to understand their product innovation goals. Three-quarters of the respondents said their corporate initiatives to address key business requirements placed “a lot of emphasis” on increasing product revenues. Top challenges reported by these companies were:

- Cost pressure from customers and sales channels (51 percent)
- Demand for shorter product lifecycles (49 percent)
- Increased competition (48 percent)
- More demanding end customers (45 percent)
- Globalization of markets and/or supply chains (36 percent)
- More complex products (30 percent)
- Faster commoditization (27 percent)

These results point toward product innovation as the logical starting point for most efforts to increase the overall innovative capabilities of an organization.

The survey findings also suggest that “product innovation can be managed and measured, yielding improvements that lead to better bottom-line business results.”

[The Product Innovation Agenda Benchmark Report. AberdeenGroup, 2004.]

As an integrated, information-driven approach to managing all aspects of the product lifecycle, product lifecycle management, or PLM, is at the core of a “design – build – support anywhere” strategy that leverages a collaborative network to accelerate invention-to-innovation cycles.

A comprehensive digital product platform offers unprecedented capabilities to global teams by bridging siloed departments and systems and providing a virtual environment for collaboration. Recent research shows that the source of innovation increasingly lies outside traditional boundaries. According to a Forrester survey of manufacturers worldwide, “20 percent of them now source half of their inventions externally, while another 20 percent license their innovations to other firms.” [Firms Confront Growing Innovation Demand. Navi Radjou, Forrester, 2005]

PLM enables manufacturers to seamlessly engage their strategic partners, suppliers and customers in the process of innovation, capturing innovative ideas wherever they arise, and providing the means to validate them and bring them to market quickly and cost-effectively.

PLM establishes an open, secure digital environment for the extended value chain

A digital product platform lets manufacturers establish a secure digital environment through which all contributors can participate in product and process innovations that result in revenue growth plus cost containment.

By establishing a single system of record, PLM makes it possible to compare, balance and optimize disparate product requirements, directly linking performance and manufacturing considerations with design intent. It digitally connects customer, marketing and regulatory requirements to designs, documents, specifications, models, test results and other types of product information that are required at different stages of the lifecycle.

PLM solutions that offer these capabilities in an open, scalable architecture can address the needs of global enterprises as well as mid-sized manufacturers whose requirements are emerging and who want to establish a digital environment that can evolve as they grow. In particular, companies can tailor their PLM environment to address:

Digital product development enables a holistic approach to new product development and introduction that stresses knowledge capture and re-use in a managed development environment. Visibility into information, programs and processes leads to greater flexibility, responsiveness and efficiency along with improved product performance and quality.

Digital manufacturing combines knowledge management with process improvement in a virtual environment that lets companies optimize the quality, process, plant, resource and simulation aspects of their manufacturing operations. Improved collaboration and control of manufacturing operations ensures the economic success of innovative product designs.

Digital lifecycle management enables the world’s biggest organizations to engage all parts of their business in the introduction of successful new products. Integrated idea capture and management, real-time conferencing and project and portfolio management tools are combined with industry-leading product design and development solutions in a single, shared source of product and process knowledge.

“...companies are succeeding in improving top-level business metrics by improving performance in product innovation, product development and engineering. Manufacturers surveyed reported double-digit improvements in product revenue (19 percent), decreased product costs (15 percent) and reduced product development cost (16 percent) by improving product innovation processes. Interestingly, there are a wide range of improvement actions and technology enablers – known as product lifecycle management, or PLM – being employed to reach these performance improvements.”

[The Product Innovation Agenda Benchmark Report. AberdeenGroup, 2004.]

What is PLM?

PLM is an enterprise strategy built on common access to a single repository of all knowledge, data and processes related to your products. As a business strategy, it lets distributed organizations innovate, develop, support and retire products as a single company. It captures best practices in products, processes and intellectual capital for re-use.

As an information technology strategy, PLM builds a coherent data structure that enables real-time virtual collaboration and data sharing among geographically distributed teams. It lets companies consolidate systems while leveraging existing investments during their useful lives. Through open APIs and industry standards, it minimizes data translation issues while providing information access to those who need it. It provides visibility into workflows and dependencies critical to management decision-making at all stages of the product lifecycle.

Innovation is not simply one item on a checklist of requirements. Ideally, it is a process that becomes standard practice, and it must be supported by implementing the right technologies. Fortunately there are incremental steps that provide substantial rewards along the way.

Through a series of critical initiatives, key business requirements – innovate more, move faster, be compliant, get optimized, go global – can be systematically enabled. Each initiative gives manufacturers the opportunity to establish the PLM framework, best practices and product-related data that will form the core of their Global Innovation Networks.

How each company proceeds depends upon their strategic goals.

Key product-centric investment initiatives begin the process, delivering near- and long-term results

Key investment initiatives enable product-centric innovation in any industry. The following pages explain the business challenges and rewards that can accrue from each one. Manufacturers should start their journey toward establishing a Global Innovation Network by addressing the area that is most critical to their business in the near term. Ultimately, they'll achieve the full benefit of PLM through the combined power of implementing all these initiatives.

New product development and introduction

Design, simulate, validate and manufacture innovative products by establishing real-time, global collaboration among people and processes in R&D, product planning, sourcing, development and launch.

While a majority of executives rank new product development among their top priorities, less than 20 percent view their own IT organizations as innovative. To reduce development time for demand-driven innovation, a number of companies are reexamining product development's traditional linear flow from design through manufacturing and sales. The current process is far too slow, even in industries with a reputation for quick response. For example, the median time-to-market for consumer packaged goods is 27.5 months.

The new product development initiative creates a real-time, global, collaborative environment for product development that integrates people, processes and systems. It links the functional execution and management of product programs through simulation, design, validation and manufacture. As a result, critical paths, key dependencies and leverage points are outlined early and acted upon quickly. The best ideas are tested and validated against market opportunities.

PLM enables success in this initiative by providing the means to:

- Reduce cycle times and speed new products to market
- Support an environment for global product development
- Help evaluate innovations and develop related products
- Accurately identify the demand for new classes of products

Case in point: Canon set high expectations when the company undertook the design of its digital EOS 20D camera for advanced amateurs and professionals. Canon wanted to create an ergonomic, aesthetically pleasing camera that delivered both high-image resolution and speed – a major technology challenge. Inspired by the company's "aggressive design" philosophy, Canon implemented a new class of development tools to manage the entire product development process. Rapid prototyping in conjunction with the 3D modeling lowered costs, shortened cycle times and delivered a superior product that became an instant hit with consumers.

Approximately 86 percent of new product ideas never make it to market and of those that do, 50 percent to 70 percent fail. What's more, 69 percent of companies say that their product introduction processes are not under financial or strategic control.

[DMA research on new product development practices: Updating trends and benchmarking best practices. Journal of Product Innovation, Volume 14, Issue 6]

Value chain synchronization

Respond effectively to global demand by optimizing the exchange of ideas as well as product and process information among all players at every stage of the value chain.

Innovators do not perceive their supply chains as being passively connected, but rather as strategic tools whose power can be harnessed to reduce costs while improving product quality and innovation. Those on the leading edge of innovation talk about implementing a demand-driven supply chain with seamless PLM processes tightly integrated.

Value chain synchronization establishes the basis for a design anywhere, build anywhere global strategy. It helps companies gain the needed visibility to collaborate across the value chain. Engineering and procurement are integrated with suppliers. Design data is synchronized with workflow-driven processes. And manufacturing processes are aligned and simulation results are shared with OEMs. The exchange of knowledge and information is enhanced at every link in the value chain so that the best ideas, assemblies, parts and process data are readily shared. Efficiency is maximized so companies can improve processes, slash costs and respond quickly to demand.

PLM enables success in this initiative through the ability to:

- Quickly align strategic partners for success
- Connect global suppliers to synchronize cost, quality and availability
- Align partners and suppliers to minimize cost and maximize quality
- Manage requirements in a global partner environment

Case in point: Eclipse Aviation implemented a PLM system in large part to get visibility and synchronization into the value chain. PLM systems serve as “virtual factory systems” allowing manufacturers to digitally design and validate factory-floor processes before investing expensive machine-tool equipment or outsourcing manufacturing processes to strategic partners. Visualizing the shop floor effectively links the shop floor into the product planning and product development process, closing the loop between finished goods and product designers. Since every step of the manufacturing process is synchronized along the value chain, assembly time for Eclipse Aviation jets was reduced from months to days.

Value chain innovators are 78 percent more likely to use sophisticated technology and sourcing tools, and they invest 189 percent more than the laggards in technology that connects them with strategic partners and suppliers. Such companies capture four times the information about their overall spending than the average company, enabling them to sense and respond to opportunities more effectively, according to industry experts. In addition, these companies see more than a 30 percent reduction in finished goods inventory and a 25 percent improvement in on-time delivery, according to AMR Research.

[Insights into Supply Chain Innovation in Europe. AMR Research, 2006]

Enterprise data management

Leverage physical and intellectual assets for greater competitiveness by managing and providing secure access to critical product and process data over the life of the product.

Effective enterprise data management breaks down barriers between siloed systems and departments, ensuring that the right people receive timely and accurate answers every time. Physical and intellectual assets can be leveraged more effectively to increase product competitiveness.

This initiative opens up silos of information and provides a secure, single point of reference for product and process knowledge. All authorized personnel get fast access to the information they need and are able to share product knowledge with team members no matter where they are located. To facilitate and improve decision-making, critical data is matched with other relevant information throughout the product lifecycle.

PLM enables success in this initiative through initiatives that:

- Unify people, processes and products to support rapid and strategic decision-making
- Control and share product and process data globally
- Institutionalize best practices and minimize nonvalue tasks
- Manage, analyze and track all product and process requirements

Case in point: Gamesa – one of the largest manufacturers of technologically advanced products, installations and services in the aeronautics and renewable energy sectors – reduced the impact of design changes throughout its supply chain by establishing a PLM environment that allows its design and manufacturing engineers, purchasing agents, marketers and suppliers around the globe to share information and collaborate in real time. Today, the company constructs electronic mockups for each prototype which are incorporated into assembly models for each aircraft. Bills of material are created automatically, and can be configured to handle an infinite number of product variations without additional programming. With these new capabilities, design errors were reduced by 88 percent on a major project. With fewer errors, the manufacturing cycle also improved for its subcontractors.

Commonization and re-use

Create efficiencies and foster best practices in engineering, manufacturing, purchasing, sourcing, marketing and support by re-using proven parts, assemblies, equipment and processes.

Many manufacturers are finding that commonization and re-use gives them the ability to reduce costs, improve quality and bring products to market at a faster pace with few recalls. It allows parts libraries to be quickly searched by engineers, enabling them to make minor changes as needed to fit new product designs and then automatically test them for manufacturability, quality and other key requirements.

To understand the benefits of consolidated enterprise data management, independent analyst firm Forrester Research interviewed several large Fortune 500 customers during the past six months. Most enterprises claimed cost savings of 25 percent or more through centralized data management solutions. At one large company, a major standardization initiative achieved ROI of more than 150 percent in a five-year period. Another global giant reported \$20 billion in cost savings over a three-year period.

[DBMS Platforms Standardization Can Lower Costs and Improve Efficiency. Forrester, 2005]

By making key data readily available for commonization and re-use, companies maximize their ability to apply best practices to the development of new parts. Bad product ideas are quickly eliminated. Efficiencies are created in design, manufacturing, testing and compliance. Existing strengths in parts, assemblies, equipment and processes are all leveraged to the highest degree. Manufacturing processes are automatically modified and revalidated.

PLM enables success in this initiative by providing tools to:

- Minimize new development activities by leveraging common parts/platforms
- Access and use existing parts and assemblies across the global value chain
- Leverage existing parts in multiple products to reduce development and parts cost
- Eliminate validation activities by using previously certified parts

Case in point: FEI, a manufacturer of high-tech laser machines, is a global company with four development sites, each with its own business processes and systems, making it very difficult to exchange information and re-use knowledge. The company turned to a PLM solution specifically designed to ensure commonization. FEI's PLM-based initiative improved the company's ability to define and implement common components and processes across the enterprise. As a result, common architectures, common designs, system re-use and part and component re-use are now standard practice. FEI is now capable of synchronized multi-site development that leverages the unique capabilities of each site.

Knowledge and IP management

Continually improve product and process development by capturing and automating the knowledge of your expert employees.

To truly embrace new and innovative ideas from multiple sources, companies must gather and make available relevant product and process knowledge from and to key constituents. Knowledge and IP management empowers decision-makers by enabling the exchange of accurate and timely information with the right people – from ideation, engineering and design through specification and requirements, sourcing, manufacturing, production, sales and service.

The result is improved product development productivity and collaboration, plus accelerated throughput. Product quality is improved by re-using knowledge contained within the enterprise and among strategic partners.

Purdue University researchers point to significant savings in time and money made possible by this key initiative. "Designers spend about 60 percent of their time searching for the right information, which is rated as the most frustrating of engineers' activities," says Karthik Ramani, a professor of mechanical engineering and director of the Purdue Research and Education Center for Information Systems in Engineering. "The whole power of computers is lost if you are not able to retrieve and 're-use' what you have created in the past."

[Ramani, Karthik. Purdue News, 4-20-04]

"Manufacturers indicate that collaboration capabilities rank very highly in improving product revenue, with more than half of respondents indicating that project collaboration (66 percent) and design collaboration (50 percent) are very important technical enablers for product innovation."

[New Product Development: Profiting from Innovation. AberdeenGroup, December 2005]

PLM enables success in this initiative by helping companies:

- Eliminate time-consuming redesign cycles by leveraging corporate-wide knowledge
- Secure corporate IP across a global environment of partners and suppliers
- Reapply corporate innovations in new product environments
- Enforce consistency and quality of company innovations/brand attributes

Case in point: Early on, Ascom Electronic Industrial Services realized that a centralized knowledge base encompassing internal manufacturing systems and extending beyond the enterprise was critical to improved product quality and shortened cycle times. The company's PLM system automatically collects product-specific information from disparate systems throughout every step of the design and manufacturing process. As a result, the company's storehouse of knowledge has tripled. The knowledge base supports tools that proactively identify problems and take fast corrective actions. Analysis and correction loops are much shorter and less costly, and new product introduction occurs up to 10 times faster.

Regulatory compliance

Mitigate risk and achieve compliance by ensuring adherence to environmental, safety, financial and governmental regulations early in the design cycle and by automating data collection and reporting.

Compliance issues can have a significant impact on the value of manufacturers' product innovations. In addition to major fines and negative publicity, noncompliance can keep products out of certain markets, increase downstream costs and eat away at product revenues and profits.

By establishing an enterprise-wide digital PLM environment for collaboration and innovation, companies can manage their product-related information more cost-effectively across the value chain and throughout the product lifecycle. With this class of PLM solution, companies can create a single product-centric system of record supporting environmental, safety, financial or governmental compliance. The system can warn users when designs start to deviate from acceptable standards or levels of performance. Manufacturing processes can be simulated and prevalidated to ensure safety and environmental standards. Disassembly and disposal for recycling can also be simulated.

PLM enables success in this initiative by enabling companies to:

- Quickly design-in and validate for compliance
- Develop product variations to meet regulations that differ by geography or industry
- Re-use previously certified parts and processes
- Create a compliance audit trail through quality document tracking

According to a recent report by AberdeenGroup, two-thirds of product companies currently lack insight into the regulatory, environmental and operational rules that affect their products. Nearly 80 percent of companies lack a cohesive infrastructure to track, audit or manage product compliance. [Product Compliance: Protecting the Value of Innovation, AberdeenGroup, December 2005] That same report found that companies that elevate the focus on compliance are seeing 27 percent fewer product recalls, a 15 percent reduction in design failure rates and a 31 percent improvement in the number of products in compliance.

Case in point: FMC Technologies Energy Systems uses an advanced PLM system with compliance functionality to integrate and improve the efficiency of work done in its multiple global design and production centers. In the highly competitive oil and gas business, there are numerous international regulatory agencies that dictate everything from product design to environmental issues at the job sites. The system enables the company to leverage complete product information and workflow processes consistently across the global enterprise while ensuring that all engineering documentation is managed according to regulations and that during manufacturing, parts are always built to the correct specifications.

Production efficiency

Increase production flexibility, performance and quality by integrating product design with process design and production information in manufacturing best practices.

Production efficiency promotes more efficient collaboration and informed decision-making. It results in the creation of manufacturing best practices that deliver production flexibility, high performance and superior quality. Through a complete digital manufacturing environment manufacturers quickly identify the best strategies for boosting productivity and lowering cost. It also includes capturing and managing all plant, process, product and manufacturing resources. Interconnecting design with manufacturing engineering creates robust work instructions and share-as-built data. Seamless interconnection with multiple manufacturing and support subsystems is a key success factor.

PLM enables success in this initiative by:

- Designing and validating production processes to achieve top quality
- Establishing global manufacturing standards while delivering local product configurations
- Institutionalizing best production process to maximize resource use
- Ensuring that standards are maintained while meeting cost/volume specifications

Case in point: In order to reduce development time of assembly systems, ATS Automation-France implemented a PLM system to automate tools for designing all its assembly systems. The solution was aimed at optimizing workspace and reducing cycle times for manual assembly workplaces by providing better line flexibility and reducing assembly times through collaborative engineering.

ATS expects to triple the number of automation alternatives it can explore while decreasing the number of layout modifications made on manual workplaces. Already, productivity boosts have been substantial: a dramatic reduction in the number of production layout modifications, reduced assembly cycle times by 10 percent and reduced product lead times by 50 percent.

Great ideas cannot be translated into profitable products without efficient production processes. Research has shown that decisions made during the design period determine 70 percent of the product's costs, while decisions made during production only account for 20 percent of the product's costs. Further, decisions made in the first 5 percent of product design could determine the vast majority of the product's cost, quality and manufacturability characteristics.

[Design for Manufacturability, DRM Associates, 2001]

Systems engineering and mechatronics

Improve the customer's value experience and accelerate time-to-market by optimizing product performance, integration, quality and reliability through the visual analysis of interdependent mechanical, electrical and software subsystems, constraints and components.

Systems engineering and mechatronics establish an integrated approach to the design of products that includes complex components, subsystems or computer controlled electro-mechanical systems. Advanced PLM systems with mechatronic capabilities can model and analyze interactions among the requirements, subsystems, constraints and components of complex products that can include mechanical, electrical and software elements.

These systems allow engineers to rapidly model and evaluate design alternatives to ensure that products are right the first time. Real-time decision-making takes place in the context of customer needs and traceability is supported throughout the life of the product.

Key characteristics of PLM systems with this capability:

- Rapidly evaluate design alternatives in complex mechanical, electrical and software systems and subsystems
- Manage varying complex configurations to meet global requirements
- Use “what if” scenarios to balance the mix among systems and subsystems to minimize cost
- Automate product requirements validation across multiple disciplines

Case in point: Among the world's leading suppliers of aircraft engines, Pratt & Whitney takes a systems engineering approach to a design process that includes mechatronics – the synergistic design and lifecycle management of integrated mechanical and electronic components. In an industry first, the company's PLM system allowed it to develop a fighter engine and associated support systems at the same time. Assemblers and flight-line mechanics participated in the aircraft's design from inception. As a result the engine has 40 percent fewer major parts than similar engines. It also cuts requirements for support equipment and labor by half and will require 75 percent fewer shop visits for routine maintenance.

Mechatronic applications have become pervasive in a wide variety of products, such as anti-lock braking systems, SLR cameras and aerospace “fly-by-wire” systems. In many cases, the development of electronics and embedded software often exceeds that of mechanical components. Mechatronics has greatly contributed to the complexity of designing, manufacturing and delivering products.

▶ Global Innovation Networks – The model for the future

There is no question that the road to sustainable competitive advantage that creates revenue growth while effectively managing costs can be made in incremental stages that provide value along the way.

The expectation that growth will come from more innovative, successful products that delight customers around the world is gaining more executive attention. Yet, manufacturers have a long way to go in creating a culture and an environment for continual innovation.

Those who partner well with partners, suppliers, customers and Siemens PLM Software – and who are open to non-traditional sources of new ideas – will transform their business and achieve their goals. Examples of this success can be found in every industry.

GM Daewoo sees early results

A leading manufacturer of vehicles, engines and transmissions, GM Daewoo Auto & Technology Co. (GM Daewoo) is a global company seeking to innovate through active collaboration with strategic partners, suppliers and customers worldwide. GM Daewoo management identified PLM technology as the most effective foundation on which to build a dynamic Global Innovation Network. PLM technology would provide the infrastructure for transforming and streamlining the global product development process, thus enabling the company to react faster to market demands and optimize resources across the extended enterprise. The system would boost productivity in a variety of ways: by speeding access to information, by replacing part of physical prototyping and basic digital mockup with advanced digital validation and by increasing the re-use of existing product information.

PLM serves as a foundation for Global Innovation Networks

GM Daewoo began moving down the road to innovation by implementing a PLM solution from Siemens based on NX® and Teamcenter® software. NX provided parametric and assembly design capabilities that quickly reduced the time needed to modify a design by approximately 66 percent for average long lead items. Designing in 3D brought the ability to perform virtual design reviews, which reduced travel costs for this activity by half. Being able to design in context improved initial mathematical quality of the design data. GM Daewoo embedded validation functions within NX so that designers automatically comply with GM's global standards.

Benefits to the business

In just one year, GM Daewoo's PLM implementation generated remarkable results. For example, engineering system costs in 2004 were approximately \$15 million lower than in previous years. Increased knowledge re-use and faster access to product information had both direct and indirect effects on reducing vehicle development time by up to six months. And concurrent car program development increased by 50 percent.

GM Daewoo's PLM solution:

- Streamlines the global product development process using PLM technology for quicker adaptation to market trends
- Boosts productivity through digital validation, faster information access and knowledge re-use
- Supports collaboration with strategic partners
- Meets customer and regulatory (environmental) demands

Backed by an innovation-driven culture, Dyson leads its market by elevating the vacuum cleaner to a high-performance work of art

Founded in 1993, Dyson quickly became a recognized innovator when it released the Dyson DCO1 Dual Cyclone, the first vacuum cleaner with constant suction. Over the following decade, Dyson has grown to become the top-selling vacuum cleaner manufacturer in Western Europe and the leading vendor of upright vacuums in the US. Dyson's most recent innovation, the Dyson DC15, incorporates the revolutionary ball technology, which replaces rigid wheels with a highly maneuverable ball that easily glides around furniture. To continuously produce breakthrough vacuum cleaners, Dyson began transforming the way it conducted business. This required the creation of a new product development team and the implementation of a next-generation digital product lifecycle management system.

PLM solution supports innovation-driven collaboration

Dyson's PLM system enabled a group of over 100 R&D engineers to collaborate on a Global Innovation Network. Designers involved in testing and developing new technologies and the engineers responsible for the actual detail design for the D15 were united into a highly focused team. The PLM system allowed them to produce detailed 3D models to clarify their thinking and refine the ball mechanism. Designs created by the system were used for rapid prototyping, supporting the swift creation of physical models for testing and evaluation. Accelerated prototyping, improved accuracy and the elimination of design errors considerably shortened time-to-market. Dyson's PLM system also enabled engineers to work far more productively with strategic partners, such as its purpose-built assembly lines in Malaysia. The high quality of the data generated through rigorous simulation and prototyping ensures fast turnaround. Toolmakers are able to access modeling data for the DC15 and employ it directly into their complex cutting tools.

Benefits to the business

Since implementing its PLM solution, Dyson has managed to keep cycles to less than three years. Other benefits include:

- Advanced 3D modeling including simulating motion and part interaction
- Leveraged design geometry for rapid prototyping
- Development cycle times maintained despite increasingly sophisticated technology
- DC15 achieved widespread success as the most advanced and innovative vacuum cleaner on the market

Bosch und Siemens Hausgeräte (BSH) relies on Global Innovation Network to drive global collaboration

Consumer products giant, Bosch und Siemens Hausgeräte GmbH (BSH), is a global enterprise selling large and small household appliances, as well as an assortment of internet-compatible household appliances under the Bosch and Siemens brand names. With 300 patents and trademarks, the company is widely acknowledged for its culture of innovation. To move to greater levels of innovation, BSH looked for ways to better leverage its worldwide team of more than 600 design engineers. The goal was to create a managed development environment that would support a virtual design team powered by its own collective knowledge. To achieve this goal, the company adopted a “single system strategy.” This required standardizing on a Global Innovation Network using a PLM backbone system able to support global collaboration.

PLM system supports the company’s single system strategy

With this system in place, BSH has streamlined the process of global collaboration and innovation. Design data (in the form of 3D models) is utilized throughout the entire development and production process. The single system strategy enables the company to function as a single, fully integrated enterprise spanning all design locations. The PLM solution provides fast access to up-to-date product information no matter where users are located. Approximately 550 design workstations run on this new collaborative platform. Programmers can access all relevant data no matter where workstations are located. And programs can be re-used at other locations with very little modification.

Benefits to the business

Key benefits of the solution include faster time-to-market and the ability to develop breakthrough products that truly differentiate. BSH’s PLM solution permits the level of innovation that is critical to success in the consumer products market. Results include:

- Standard platform for worldwide development and collaboration
- Secure knowledge base that provides timely and accurate information
- Time-to-market reduced by 50 percent
- Tools to model and test products in development across the entire product portfolio
- New products designed collaboratively by a virtual design team, then customized for specific locales

Procter & Gamble employs Global Innovation Network to create a collaborative community

One of the world's leading manufacturers of consumer packaged goods, retail giant Procter & Gamble (P&G) serves customers in more than 160 countries. Meeting customer demands for a wide variety of new products marketed in far-flung locations was becoming increasingly complex. P&G employs a widely distributed product development strategy that allows geographically dispersed divisions to address local needs. The challenge is to cost-effectively create innovative products and to introduce them to market ahead of the competition. Meeting this challenge requires leveraging resources globally while maintaining centralized control of operations at P&G's Cincinnati headquarters. Key to making a distributed development strategy successful is a collaboration environment that includes over 10,000 internal users and partners. P&G achieved its goal by implementing a collaborative PLM solution.

PLM provides a reliable platform for global collaboration

P&G's PLM solution was specifically tailored to support product-related team collaboration, including robust capabilities for visual collaboration in a CAD-neutral format. It also brought P&G a rich set of real-time collaboration services, including calendars, schedules, workflow, virtual meeting sites, instant messaging and virtual conferencing. As a result, significantly greater numbers of P&G employees can productively participate in the product lifecycle processes. With its PLM system, P&G gained a reliable and secure way to share information across the many firewalls, geographies, time zones and systems. The solution provides a single platform where distributed team members can evaluate product concepts by viewing digital prototypes in real-time product reviews. This includes CAE and industrial design models. To ensure that the right people receive the information they need, users can create customized views of product information.

Benefits to the business

P&G expects clear bottom-line benefits to follow the implementation of its product lifecycle collaboration solution. Enhanced collaboration will drive innovation. The ability to innovate more effectively, particularly in the early design phase, will speed time-to-market and cut costs. System benefits include:

- Supports innovation and collaboration among geographically dispersed development teams
- Provides visual product collaboration among employees and suppliers
- Speeds time-to-market and reduces costs
- Provides virtual 3D design modeling for testing and review
- Accesses product information from the desktop
- Accelerates product packaging, process and plant design

About Siemens PLM Software

Siemens PLM Software, a business unit of the Siemens Industry Automation Division, is a leading global provider of product lifecycle management (PLM) software and services with 5.9 million licensed seats and 56,000 customers worldwide. Headquartered in Plano, Texas, Siemens PLM Software works collaboratively with companies to deliver open solutions that help them turn more ideas into successful products. For more information on Siemens PLM Software products and services, visit www.siemens.com/plm.

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