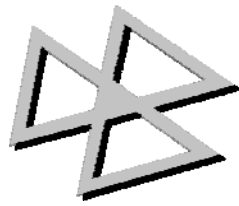


Why Should Your Organization Join the PDES, Inc. Team?



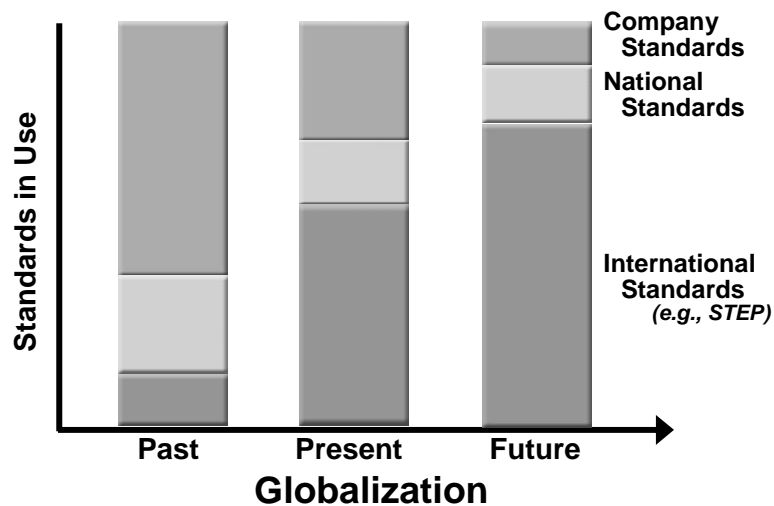
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<http://pdesinc.aticorp.org/>

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Movement Toward International Standards



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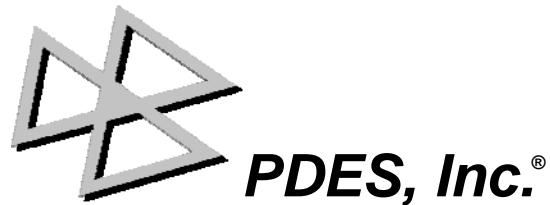
Why Should Your Organization Join the PDES, Inc. Team?

Outline



- The Role of STEP, ISO 10303
- Overview of PDES, Inc.
- The PDES, Inc. Approach
- Benefits of PDES, Inc. Membership
- Membership Requirements
- Summary
- Additional Information:
 - Members' STEP Success Stories
 - Testimonials from Members on the Importance of PDES, Inc. Membership

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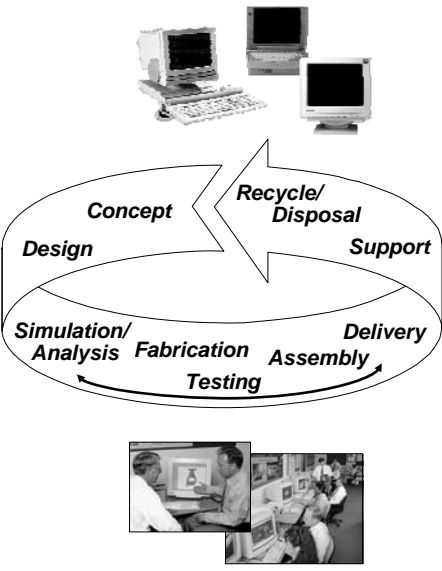
The Role of STEP, ISO 10303



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Why Should Your Organization Join the PDES, Inc. Team?

STEP is...




...an international standard (ISO 10303) for exchanging data between different systems (CAD, CAM, CAE, and PDM)

...a computer interpretable definition of the physical and functional characteristics of a product throughout its life cycle

...a proven way to ensure fast, reliable data exchange between partners and suppliers using different systems

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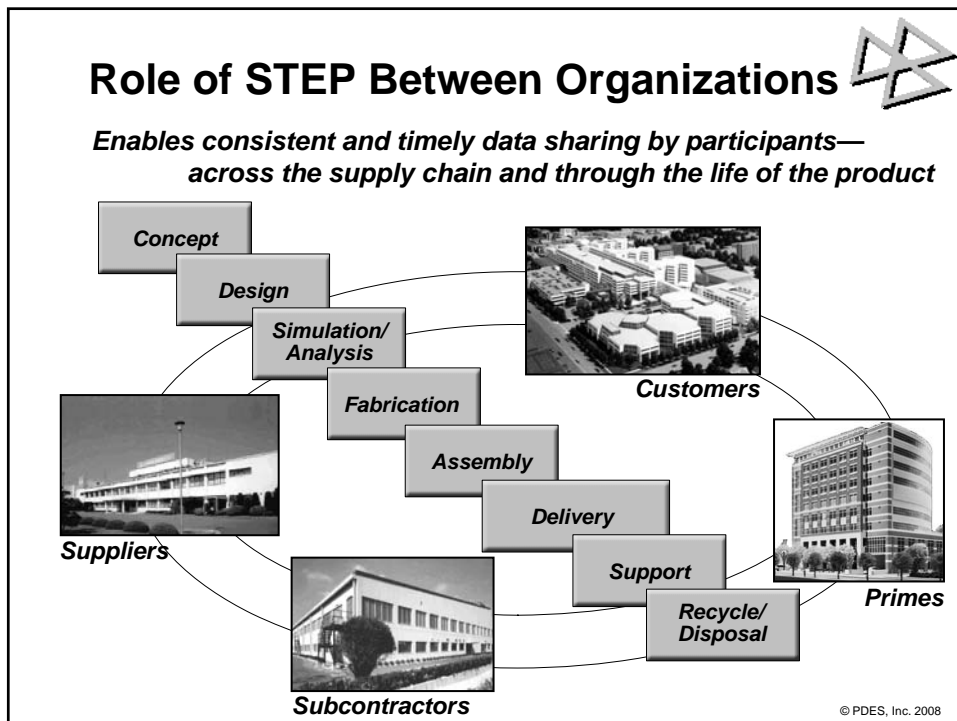
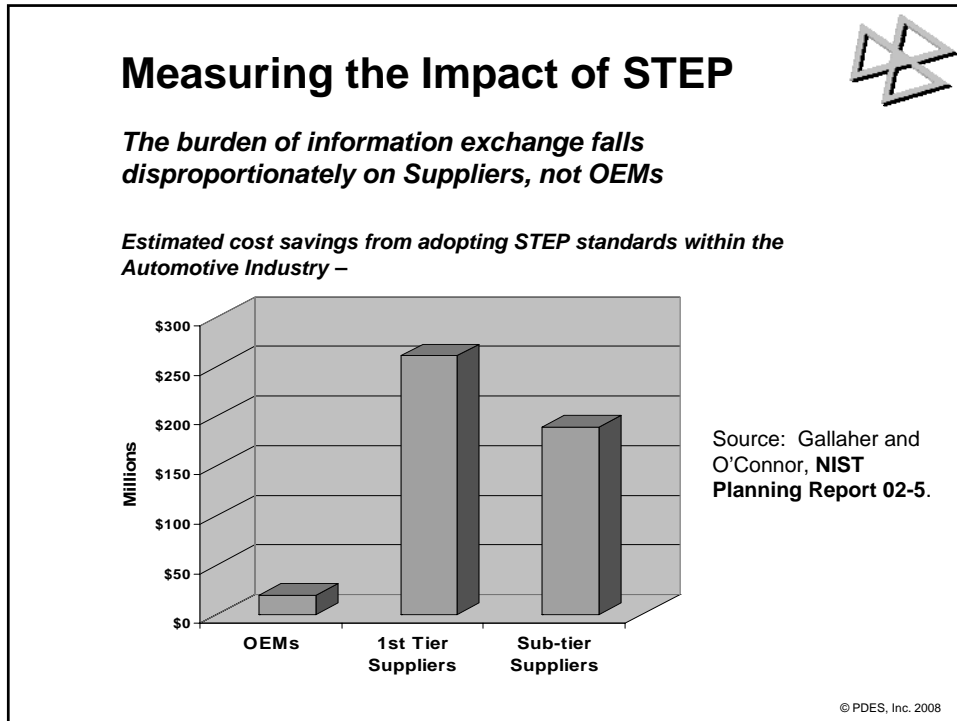
Measuring the Impact of STEP



- “We estimate that STEP has the potential of saving \$928 million per year by reducing interoperability problems in the automotive, aerospace, and shipbuilding industries.”
- “Currently approximately 17 percent (\$156 million per year) of the potential benefits of STEP quantified within the scope of this study are being realized.”

Available from: http://www.mel.nist.gov/msidlibrary/impact_studies.html
Michael P. Gallaher and Alan C. O'Connor. 2002. *Economic Impact Assessment of the International Standard for the Exchange of Product Model Data (STEP) in Transportation Equipment Industries*. NIST Planning Report 02-5. Gaithersburg, MD: NIST, p. ES-2.
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Why Should Your Organization Join the PDES, Inc. Team?



Why Should Your Organization Join the PDES, Inc. Team?

Role of STEP Across Functions of an Organization

Enables complete and accurate data exchange and use

The diagram illustrates the role of STEP across five organizational functions. At the center is a large image of an airplane. Surrounding it are five smaller images, each with a text label below it: **Product Design** (two men looking at a laptop), **Engineering Analysis** (two men looking at a laptop), **Product Support** (a woman on a phone), **Manufacturing Planning** (two men at a computer), and **Manufacturing Control** (a man with glasses looking at a screen). A copyright notice "© PDES, Inc. 2008" is located in the bottom right corner.

Role of STEP Between Designs

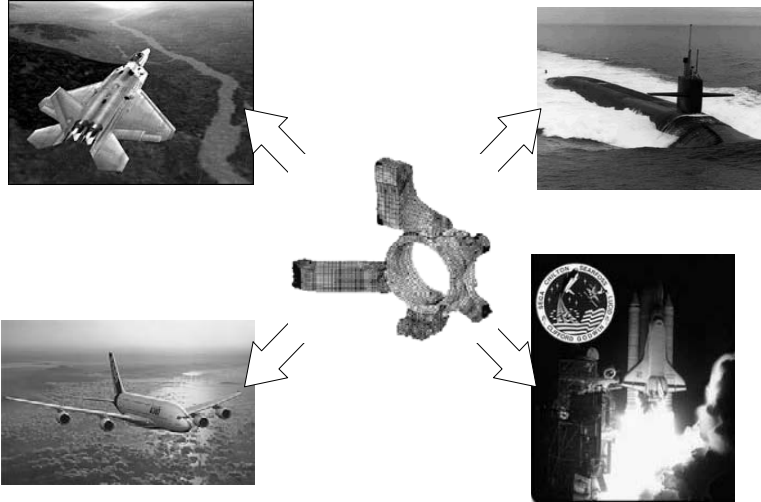
Enables reuse of design, planning and manufacturing data

The diagram illustrates the role of STEP between designs. At the center is a large image of a circuit board. Surrounding it are four smaller images, each with an arrow pointing towards the central circuit board: a sports car, a tractor, an airplane, and a tank. A copyright notice "© PDES, Inc. 2008" is located in the bottom right corner.

Why Should Your Organization Join the PDES, Inc. Team?

Role of STEP in Simulation and Analysis

Enables complex CAD/CAE integrations and data management

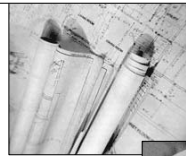


Role of STEP for Long Term Data Retention

*Enables sustainable technical information –
future use of design, simulation, analysis, planning,
manufacturing, support, recycle/disposal data*

Past

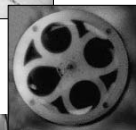
Future



Drawings



Warehouses



Tapes



CDs



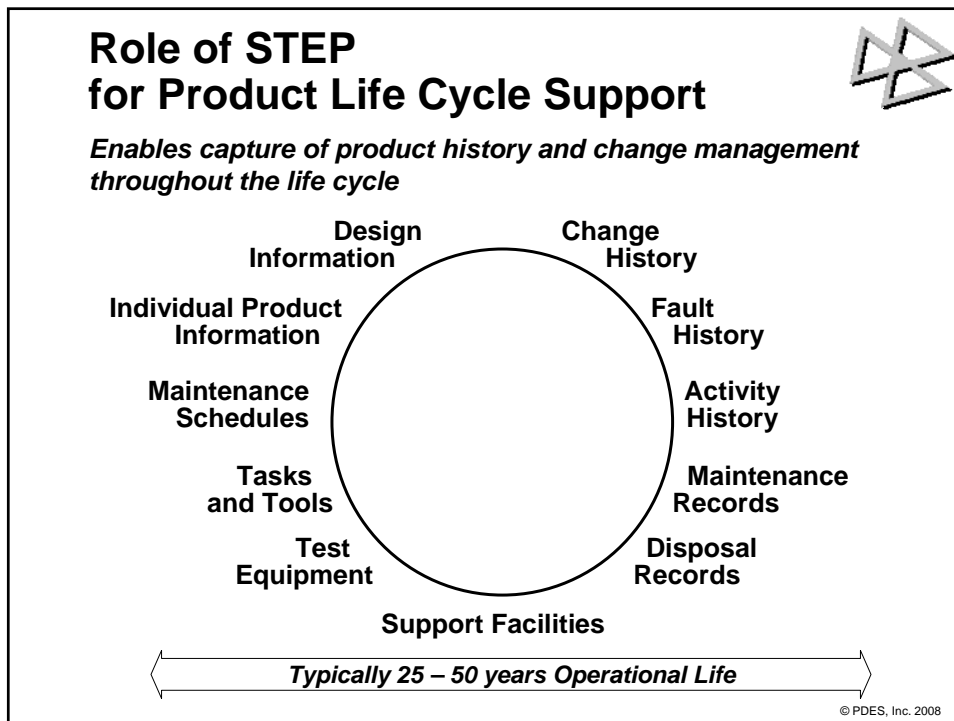
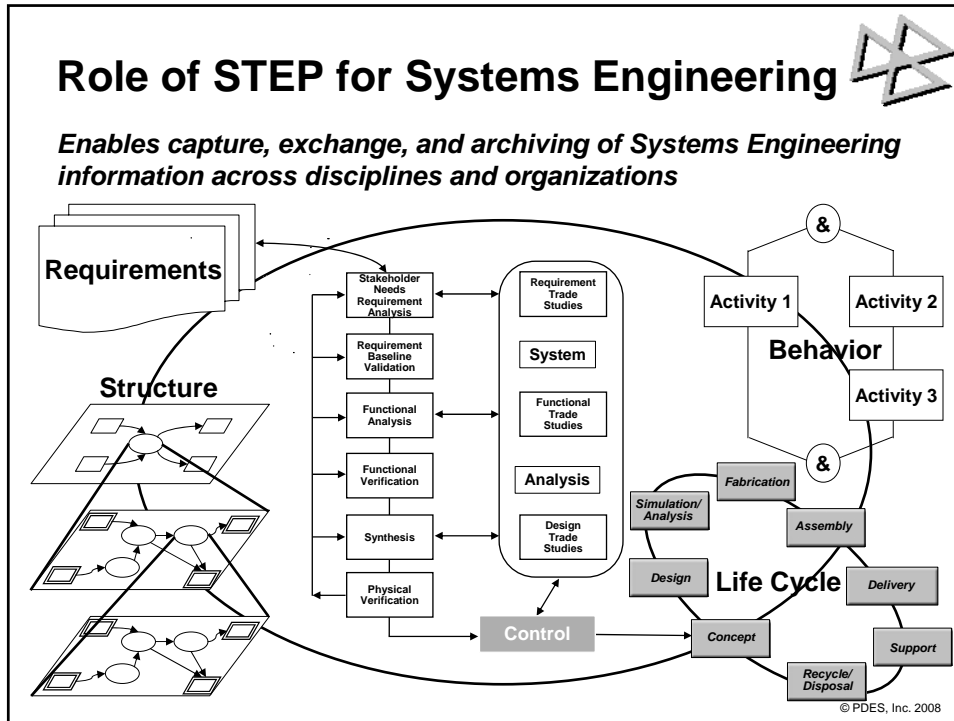
**Underground
Mines**



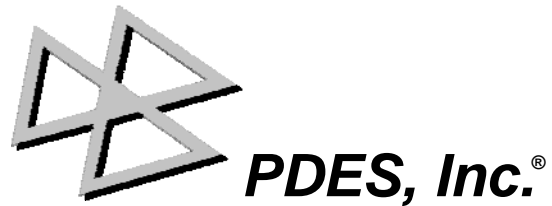
**Neutral STEP
Archival Database**

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Why Should Your Organization Join the PDES, Inc. Team?



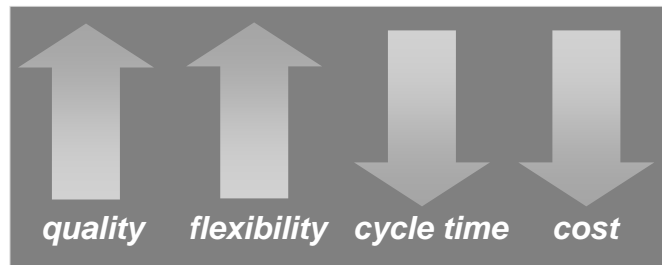
Overview of PDES, Inc.

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The Mission of PDES, Inc.



Accelerate the development, implementation, and exploitation of product data exchange using STEP to improve product quality, increase flexibility, reduce product cycle time, and reduce costs.



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Why Should Your Organization Join the PDES, Inc. Team?

PDES, Inc. Vision for 2020



Be the world leader in accelerating the development, implementation and use of STEP and related product data standards to deliver extraordinary business value to member organizations

Initiatives

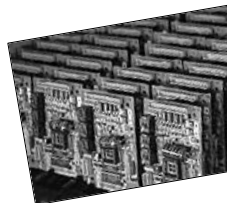
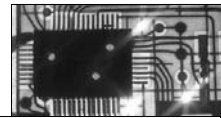
- Model Based Engineering
- Model Based Manufacturing
- Model Based Sustainment
- Integration & Data Exchange Testing
- Information Standards

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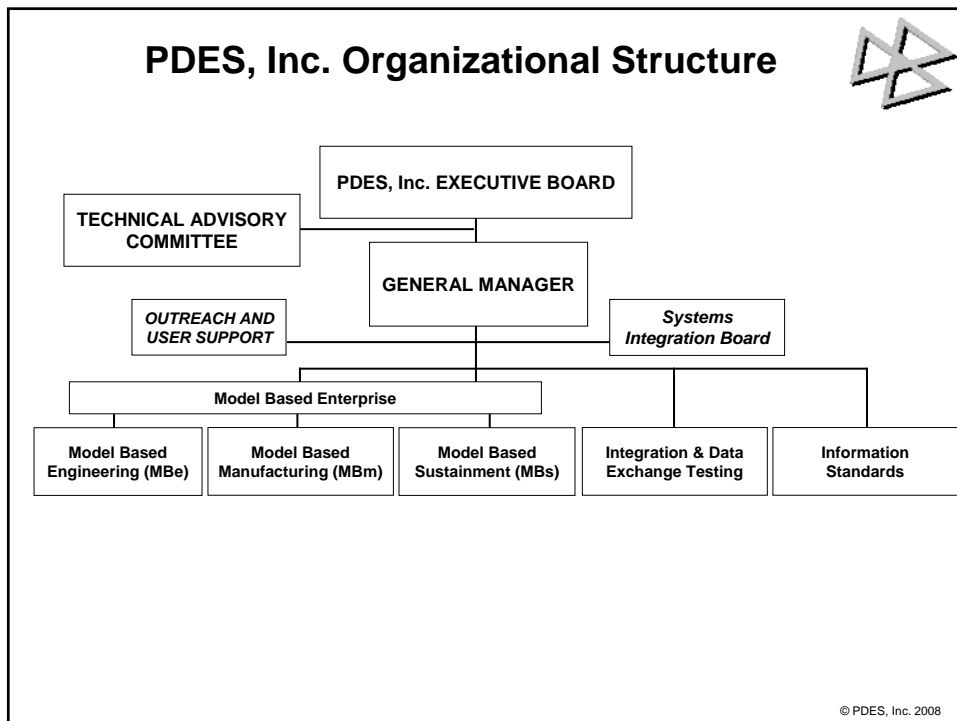
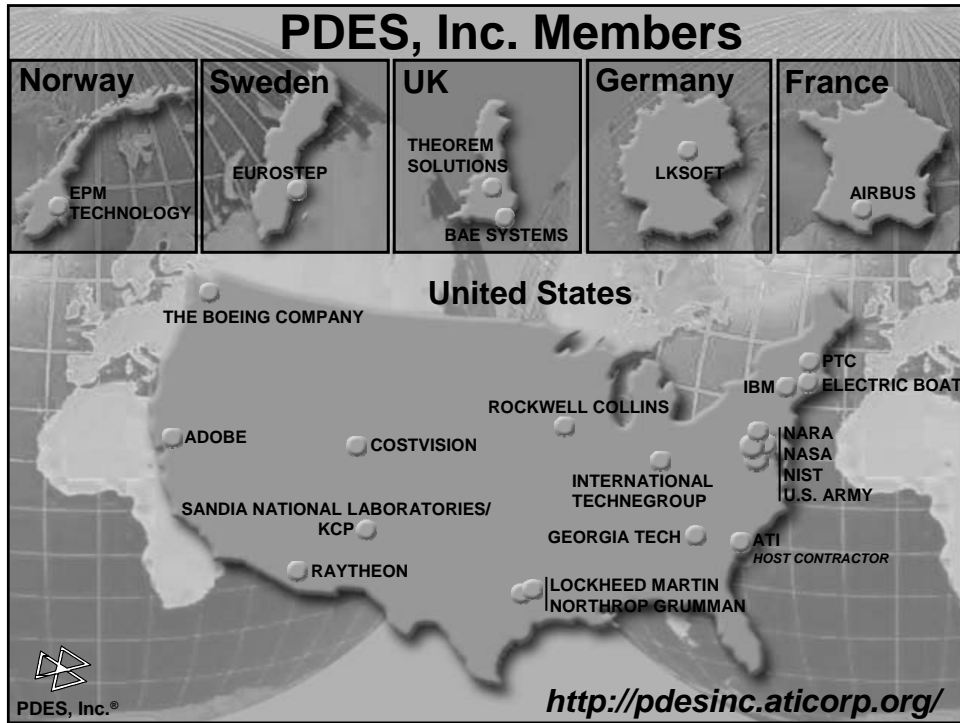
PDES, Inc. Members Represent Many Industries and Diverse Government Needs



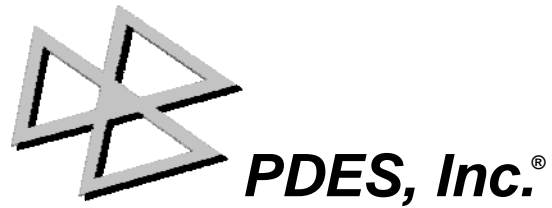
- Aerospace
- Automotive
- Electronics
- Shipbuilding
- Software



Why Should Your Organization Join the PDES, Inc. Team?



Why Should Your Organization Join the PDES, Inc. Team?



The PDES, Inc. Approach

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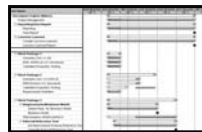
Technical work is conceived, planned, and managed by members



- Operate as a virtual company using personnel resources contributed by members



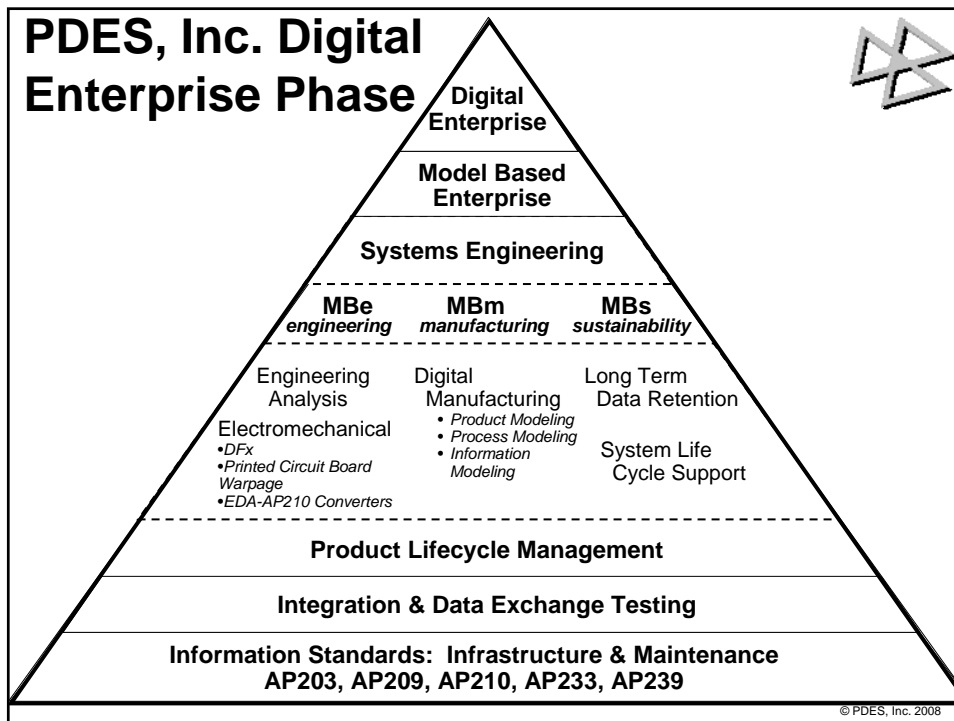
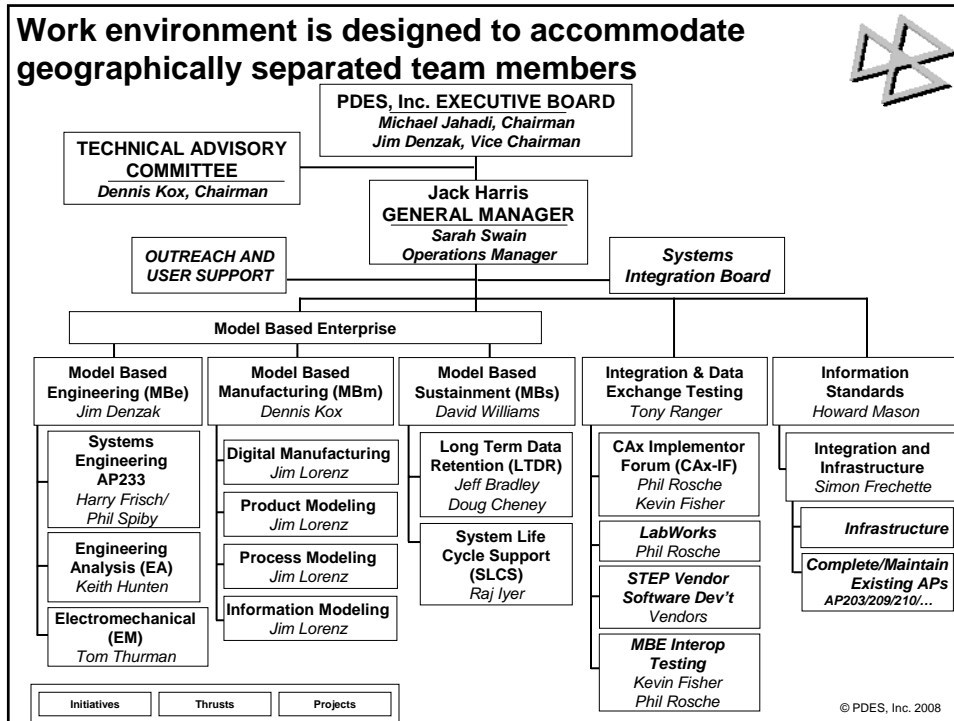
- Survey member organizations for their requirements and priorities



- Organize work into projects with deliverables and schedules

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Why Should Your Organization Join the PDES, Inc. Team?



Why Should Your Organization Join the PDES, Inc. Team?

Proven management techniques promote teaming across a distributed workforce



- **Work is guided by the *Program Plan***
 - Maintained as a living document, updated on a frequency that meets member company requirements
 - Clearly defined *Work Breakdown Structure (WBS)*
 - » Each WBS element with assigned team member responsibilities
 - Clearly defined *Task Schedules*
 - » Staff hour estimating/tracking by WBS element
 - » Member staff hour reporting by WBS element
- **Consortium leaders, technical resources meet regularly**
 - Executive Board, Technical Advisory Committee meetings
 - Team Leader meetings and conference calls
 - Technical Team Offsite meetings and Implementor Roundtables with vendors, team conference calls
 - Participation in STEP- and project-related standards, technical, and professional meetings
- **Technical teams communicate regularly**
 - Via email and customized email exploders
 - Using team-specific websites, secure file transfer mechanisms

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Work is coordinated with other standards organizations and technical programs

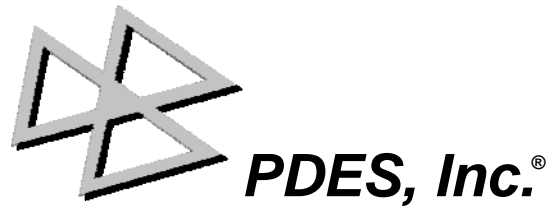


- Work with the established National and International standards structure
- Establish formal relationships with other significant organizations, programs, and consortia
- Pursue funding for complementary projects



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Why Should Your Organization Join the PDES, Inc. Team?



Benefits of PDES, Inc. Membership

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Benefits for Major Manufacturing Companies



- STEP expertise to assist in complying with Defense Department requirements to utilize STEP for 2D and 3D product model data*
- Participation in Pilot Projects to insert STEP technology into their companies
- Cross-industry collaboration and access to lessons learned, recommended practices
- Education and help in establishing effective ways to integrate systems and supply chains
- Leverage in efforts to advance international standards for product data exchange
- Access to world's leading experts and knowledge base in STEP deployment

* Examples: US Navy, UK MoD, Norwegian Defence Forces all require use of ISO 10303 (STEP)

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Why Should Your Organization Join the PDES, Inc. Team?



Benefits for Small- and Medium-Sized Enterprises



- Opportunity to utilize STEP for avoiding costs, reducing system redundancy
- Opportunity to establish strong relationships and work closely with leading prime contractors and OEMs
- Access to STEP experts support for using STEP in production implementations
- Access to training and assistance in STEP deployment
- Insight into industry directions and requirements for integrating with suppliers
- Opportunity to communicate problems/issues with regard to implementation

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Benefits for Software Developers



- Opportunity to establish strong customer relationships and participate in pilot projects with them
- Opportunity to gain new business with leading companies
- Opportunity to gain insight into industry requirements for product data exchange
- Ability to influence what goes into the standard
- Access to world's leading experts and forum for implementing STEP

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Why Should Your Organization Join the PDES, Inc. Team?



Benefits for Government Agencies and Systems Integrators



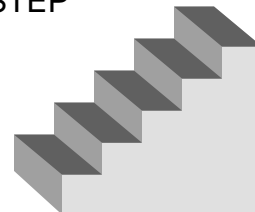
- Forge strong relationships with key decision-makers from leading companies
- Gain insight into industry requirements and the challenges of integrating systems and supply chains
- Gain access to world leading experts and knowledge base in STEP deployment
- Participate in driving requirements in STEP for systems integration, downstream use, etc.

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PDES, Inc. helps members work through the STEP learning curve



- Access to STEP training courses, materials, and workshops
- Availability of expertise in STEP, standards development, and related technologies
- Participation in Pilot Projects and benefits from lessons learned during all pilots
- Access to *Recommended Practices and Usage Guides*
- Technical Team Offsite participation
- Use of the Members-Only website with STEP information and links to other key STEP resources
- Free access to ISO/SC4 standards via the Members-Only website



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Other Benefits



Tap into a knowledge base of STEP experts

- Comprehensive vendor test bed—all major CAD systems and STEP translators
- Focused pilot projects in high pay-off areas
- STEP product testing in a dynamic environment over the Internet
- Training and education from the world's leading experts in STEP
- Recommended Practices and extensive Lessons Learned from STEP deployments in industry
- Cross-industry knowledge sharing

--more--
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Other Benefits



Work together to leverage collective efforts

- Insight into industry Enterprise Integration strategies
- Hands-on experience in using STEP tools and technology
- Rapid access to STEP expertise and consultants
- Direct influence on setting the standard
- Up-to-date awareness of vendor product capabilities and plans
- Focused cost sharing and cross-industry collaboration on STEP

--more--
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Other Benefits



Realize high Return on Investment

- Ability to work closely with customers and suppliers
- Support for internal STEP implementations
- Participation in technical workshops
- Leveraging requirements on vendors
- Membership in the International Industry STEP Centers (ISC)
- Free access to ISO/SC4 standards via the PDES, Inc. Members-Only website

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Benefits Summary

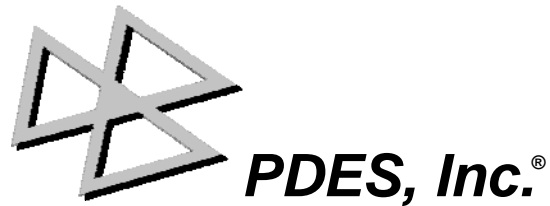


- STEP is fundamental to meeting business goals
- PDES, Inc. members benefit from:
 - A head start in implementing STEP
 - » Training
 - » Hands-on experience
 - » Dedicated team assistance
 - » Software tools
 - The additive effect of leveraged resources
 - » Cost sharing
 - » Influence on vendors and users
 - » Influence on developing/enhancing standards

PDES, Inc. membership is a good investment!

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Why Should Your Organization Join the PDES, Inc. Team?



Membership Requirements



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Membership Requirements for Industry Members (Users and Vendors)



- Pay annual dues based on organization type and annual revenue:

<i>Type of Organization</i>	<i>Organization Annual Revenue</i>	<i>Annual PDES, Inc. Dues</i>
User (large)	Greater than \$1B	\$50,000
Vendor (large)	\$50M or greater	\$25,000
User (medium)	\$50M to \$1B	\$25,000
User/Vendor (small)	Less than \$50M	\$0

- Annually contribute minimum of one full time equivalent (FTE) resource (1800 hours)

Vendors may use internal STEP product development activities to meet up to 50% (900 hours) of their FTE requirement

Notes:

User is a commercial entity that utilizes STEP in conducting its business operations—for example, by using CAD, CAM, CAE tools

Vendor is a commercial entity that develops and/or sells STEP-related software products and translators

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Membership Requirements for Government and University Associates



■ Government Associates

- Annually contribute either
 - » Two FTEs (3600 hours), *or*
 - » \$25K in dues plus one FTE (1800 hours)
- Membership is “voting” or “non-voting” based on the agency’s preference

■ University Associates

- Pay no dues
- Annually contribute minimum of one FTE (1800 hours)
- Membership is “non-voting”

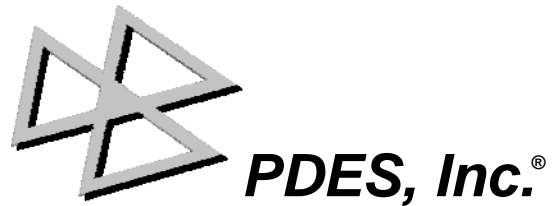
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ADDITIONAL INFORMATION

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Members' STEP Success Stories

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STEP is widely used in production at Boeing today

- Boeing routinely uses STEP in everyday production activities throughout the company
 - Collaboration across project participants (AP203)
 - Distribution to suppliers (AP232)
 - Delivery to customers (AP203, AP232)
- Use of STEP AP203 Edition 2 for long term data retention is in development for the 787 and C-17 programs
- Use of AP238 in Manufacturing is in development

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Boeing Position on STEP



- STEP is identified as The Boeing Company Standard for product data exchange
- Boeing will only consider purchase of products that comply with STEP
- It is Boeing's intent that our partners and suppliers comply with STEP as a requirement for maintaining business with Boeing

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ON DEMAND BUSINESS™






IBM continually looks for ways to leverage STEP standards in our own operations

- At IBM, STEP comprises over 25% of IBM's global e-procurement design data exchange
- In the area of collaborative design, IBM is focused on a process of Common Building Blocks (CBB) to help drive down costs. STEP is used to enable the CBB process which requires sharing designs between CATIA V5 and other CAD systems
- In evaluating MultiCAX offering, IBM concluded that STEP offers a simpler and less expensive solution:
 - Easier to use
 - Better function and usefulness with solids
 - Lower cost of implementation

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Why Should Your Organization Join the PDES, Inc. Team?



STEP is being used in production for streamlined data exchange with suppliers

- STEP adopted across Lockheed Martin as a primary means for exchanging CAD data with suppliers
- STEP supports all programs at Lockheed Martin Aeronautics Company and Lockheed Martin Systems Integration
- Business case analysis shows reduction in model reworks and improved model quality
- Pilot Implementation plan for adoption of PLCS (AP239) on the F-35 program began early 2006

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STEP for automated product data exchange between Army and OEMs


- STEP *PDM Schema* is used for data exchange between TARDEC's Windchill and AM General's Teamcenter for the HMMWV (High-Mobility Multipurpose Wheeled Vehicle)
- HMMWV pilot demonstrated significant reduction in time to exchange and validate data delivery
 - An order of magnitude savings in time savings (days to hours)
 - Automated synchronization of source and target systems ensuring configuration management and no data duplication
- TARDEC plans to deploy the solutions to other strategic OEMs such as BAE Systems and General Dynamics
- TARDEC has already standardized the delivery of 3D solid model data in STEP format from contractors

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Why Should Your Organization Join the PDES, Inc. Team?




ELECTRIC BOAT CORPORATION
A GENERAL DYNAMICS COMPANY




Electric Boat expands its use of STEP standards to support production needs

- STEP standards have become the tools of choice for many production data transfers
 - AP203 (Geometry) is used for the exchange of data for thousands of solid models each year
 - AP209 (Analysis) and AP227 (Piping) are routinely used for CAD-CAE integration efforts
 - AP227 (Piping) is used in production for PIPESTRESS transfers
 - Production and Development efforts are using XML and STEP for the Web to demonstrate data transfer using AP203, AP216, AP218 and AP227
- STEP is viewed as an enabling technology for data exchange and improved product lifecycle management capabilities
- The use of STEP standards promotes collaboration and interoperability among platforms and among vendors

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ELECTRIC BOAT CORPORATION
A GENERAL DYNAMICS COMPANY



Electric Boat uses STEP as their data exchange method of choice

- STEP is currently in production use for the exchange of solid model design data with many external customers including:

Allied Signal	Caterpillar
Atlas Casting	U.S. Department of Defense
Avondale Industries	Lunn Industries
Bath Iron Works (BIW)	U.S. Navy Labs
BF Goodrich	Newport News Shipbuilding
Boeing	Northrop Grumman

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Why Should Your Organization Join the PDES, Inc. Team?

Rockwell Collins



STEP for Electronics in use at Rockwell Collins

- STEP is playing a significant role in the design and manufacture of electronic circuit assemblies, interconnects, and packaging at Rockwell Collins
- APs 203 and 210 being used for
 - Simulation for flexible manufacturing
 - Computer integrated manufacturing
 - Integration of electrical/mechanical design
 - Capturing the product definition
- STEP supports the implementation of Rockwell Collins' enterprise integration strategy
- Rockwell Collins led the development of AP210 along with other key contributors Boeing, Georgia Tech, LKSoft, NASA, NIST, Northrop Grumman, and the U.S. Army

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Raytheon






STEP production deployment reduces costs for Raytheon Missile Systems

- STEP Technical Data Package (TDP) delivery is currently deployed in production on Exoatmospheric Kill Vehicle (EKV) program, a component of the National Missile Defense system
- Raytheon pilot (STAMP Program) demonstrated significant labor and cycle reduction for preparation and delivery of TDPs to its suppliers using STEP
 - 50% - 88% labor, 59% cycle time savings at Raytheon
 - 42% labor, 95% cycle time savings at suppliers
- Raytheon Missile Systems plans to deploy STEP TDP delivery on all programs and is actively participating in a pilot to enable STEP PDM data import from suppliers

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Why Should Your Organization Join the PDES, Inc. Team?



Currently implementing STEP on the Eurofighter Typhoon Project

- Eurofighter Typhoon is a four nation military program implementing STEP for Product Data Management (PDM)
- Partners include BAE Systems, Alenia (Italy), and EADS—European Aeronautic, Defense, and Space (consisting of CASA from Spain and Daimler Chrysler Aerospace from Germany)
- AIRBUS industry partners are currently developing STEP capability for CAD and PDM data exchange on the A3XX commercial aircraft program

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The U.S. National Aeronautics and Space Administration (NASA) has adopted STEP for data exchange

- Currently NASA is exchanging CAD models using STEP between SDRC Ideas, PTC ProEngineer, PTC ComputerVision, Solidworks, and AutoCAD
- Planned uses of STEP include PDM, electronics design, thermal analysis, systems engineering, structural analysis, and machining
- NASA's long term vision is to develop a STEP infrastructure of services supporting end-to-end, interdisciplinary data integration and data reuse

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Why Should Your Organization Join the PDES, Inc. Team?



EPM uses STEP for better interoperability and improved information quality

- STEP has established itself as one of the world's leading solutions for product data technology—the open data paradigm for the 21st century
- EPM's software products, *EXPRESS Data Manager™* support our customers' requirements to improve information quality and, thus, reduce production cost by using open and publicly available standards
- EPM has initiated pilots with Aerospace and Defense organizations to measure the value of using STEP for Long Term Data Retention and Product Life Cycle Support:
 - Data discrepancies have dropped from over 20% to less than 2%
 - The number of engineering change orders is dramatically reduced
 - Time required to distribute data has dropped from weeks to hours

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Eurostep is committed to STEP

- Since we started in 1994, Eurostep has been heavily committed to the development and successful implementation of STEP
- STEP is the only viable standard addressing the exchange and sharing of complex product data over a product's life cycle, including the archiving of data
- Technologies like XML, Web services, OWL, etc. are in fact very complementary to STEP and bring the use of STEP to the enterprise integration level
- Our game-changing software, Share-A-space, our consulting services, and the offerings from our business partners deliver true business value to our customers

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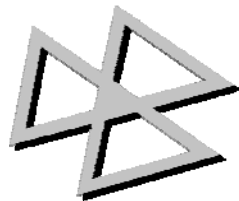
Why Should Your Organization Join the PDES, Inc. Team?



Ongoing STEP activities at AIRBUS and Pratt & Whitney

- The Aerospace Engineering Analysis (AEA) pilot project activities focused on the exchange of Configured Digital Mock-Up Information (Engineering Change and Product Structure data) via STEP for the A380 commercial aircraft
- AEA pilot members included AIRBUS, Pratt & Whitney, Theorem Solutions, EPM, and UGS
- Pratt & Whitney is “STEP-ready” and recommends and encourages the use of STEP for communication of design information with customers

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STEP and PDES, Inc. Testimonials

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Why Should Your Organization Join the PDES, Inc. Team?

Lockheed Martin Aeronautics Company



“The importance of membership in PDES, Inc. has been validated across the Lockheed Martin Aeronautics Company and is aligned with our vision. Initiatives like PDES, Inc. are consistent with our focus on seamless information flow across the entire virtual value stream. Membership has brought us great payback, particularly because of our participation in STEP development and pilot projects. Lessons learned and knowledge sharing have been invaluable. PDES, Inc. provides a very effective forum for our companies to cooperate.”

Michael R. Jahadi, Ph.D., P.E. – Senior Manager,
CAD/CAM Integration & Strategic Planning
Lockheed Martin Aeronautics Company



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US Army Tank Automotive & Armaments Command (TACOM)



“By participating in PDES Inc., US Army TARDEC has been able to leverage the hundreds of work years of effort put in by other member companies. The consortium has linked us with several innovative vendor solutions and provided a forum for the active exchange of information and soliciting feedback. We will continue this valuable relationship to help us institutionalize STEP across the Army.”

Dr. Raj Iyer – Program Manager, Product Lifecycle Management,
Tank Automotive R&D Center
US Army



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Why Should Your Organization Join the PDES, Inc. Team?

ON DEMAND BUSINESS™



“In the On Demand world that we are all now a part of, IBM has a goal of fusing technology advances with business design to create an integrated, more flexible and responsive enterprise. The only way companies like IBM can benefit from being an On Demand business is to embrace standards like STEP. Our participation and membership in PDES, Inc. is another key example where IBM and our clients have benefited by embracing standards.”

Walter Donaldson, Jr.
General Manager
WW Product Lifecycle Management

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Rockwell Collins



“Design and manufacturing software tool interoperability and seamless data exchange between manufacturing sites are absolutely critical in reducing cycle times and improving cost effectiveness of operations. The association with PDES Inc. has afforded Rockwell Collins an opportunity for collaboration to address both areas. The PDES, Inc. collaborative model has allowed us to leverage resources from a variety of industries to develop and pilot solutions to these common problems.”

Jack Harris, Director
Advanced Manufacturing Technology

**Rockwell
Collins**

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EPM Technology, part of the Jotne Group



“The PDES, Inc. organization has brought invaluable feed-back to our projects over the years, whereas use case information is of great importance to our continuous product development. PDES, Inc. provides a center-of-excellence for data exchange and sharing, and our participation allows EPM to have a radar on new requirements and first hand experience which is re-used directly in our day-to-day operations.”



EPM TECHNOLOGY

Kjell A. Bengtsson – SVP
EPM Technology

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“Membership in PDES, Inc. is adding significantly to our network. It provides excellent opportunities to network with end users as well as with other suppliers of STEP software and services. PDES, Inc. has an important role to play in gathering expertise and producing informative material as well as sharing good examples of industrial use of STEP. PDES, Inc and its members form a hub for STEP knowledge and Eurostep will continue to support PDES, Inc. and their role in bringing STEP knowledge and solutions to the end users, enabling enterprise integration.”

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Håkan Kårdén
CEO
Eurostep AB

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