



EDBP

Engineering Database Program Newsletter

Summer 1993

Chairman's Observations

Information technology plays an increasingly significant role in the integration and the management of engineering, design and manufacturing processes. The ability to efficiently bring forth an engineered product of high quality—from conceptualization to manufacturing—is of prime importance to the profitability of a corporation in a highly competitive global market. In the rapid prototyping a development environment with participation by cross-functional and cross-corporate teams, the vast amount of data generated must be stored and managed properly and effectively. Database systems are indispensable to manage engineering design data as well as to enhance the linkage between organizational and business units to product development teams. Information management is the key to success in a global market.

Over the past year several efforts have occurred to indicate that the technical and business community recognizes the importance of information management to productivity. Within ASME the Seventh Annual ASME Database Symposium, "Engineering Data Management: Key to Success in a Global Market," will be held in San Diego, California, August 10-11, 1993. The symposium's purpose is twofold: to publicize recent industrial and business successes in implementing engineering data management strategies for product conceptualization, design, development and support, and to present advances in research relevant to product engineering that are vital to survival in the

competitive global market environment. The program content is excellent and the keynote presentation, tutorial and 25 papers contain a wide spectrum of research and application experiences.

On a broader scale, the CALS Expo '92 in San Diego, December, 1992, was a highly successful event with large exhibits and demonstrations, over 100 presentations, high profile speakers and 10 tutorials. A highlight was an on-floor series of coordinated real time demonstrations of electronic exchange of design/manufacturing product data using CALS endorsed data exchange standards. The CALS Expo '93 in Atlanta, November 1-4, 1993, promises to expand their efforts. Of particular note has become the extension of CALS activities beyond the defense establishment to commercial applications. Especially noteworthy has been the growth of CALS interest overseas in Europe, Japan and Australia. The CALS Expo '92 included presentations by key government/industry leaders from Great Britain, France, and Germany. The CALS Expo '93 plans a more ambitious involvement of international and commercial groups.

Another recognition of the importance of information technology shows up in the current \$ 0.5B ARPA Defense conversion initiatives that provide funds to develop or demonstrate technology to improve productivity. A major portion of the funds will go to information integration design/manufacturing/enterprise efforts. These ARPA funding opportunities not only provide funds to develop and test concepts, but also create high interest by management in this area.

Initial Release of Step

The initial release of the Standard for the Exchange of Product model data (STEP) was voted to be technically complete by on February 26, 1993. Under development by the International Organization for Standardization (ISO) since 1984, the standard is to facilitate the exchange of product data across CAD/CAM & industry automation systems within diverse computer environments.

Information models being developed describe different product facets, such as geometry, topology, shape and form features, structure configuration, and functionality. These models are defined in the conceptual modeling language EXPRESS and are organized in application protocols for different application areas.

The development of the standard involves two major stages: i) The ISO committee stage, during which parts of the standard are crafted, proposed, and approved to Draft International Standard (DIS) status. ii) The ISO approval stage, in which national organizations participating in ISO vote on the (DIS). Eighty-nine countries are involved in this stage. The U.S. effort that supports the STEP is PDES, (Product Data Exchange using STEP). Testing and validation of the standard is supported by the National PDES Testbed of the National Institute of Standards and Technology (NIST).

The ISO committee stage development has already been completed for major portions of the standard, and the official DIS ballot period is under way. Several experimental and some vendor implementations of the standard's technical content are also under development. The initial release of

(continued on page 2)

STEP comprises twelve parts including an overview, the methodology used to present the standard, application architectures, conformance testing procedures and STEP application protocols, and addresses two priority applications areas; drafting and product configuration. Seventeen additional protocols, addressing a wide range of applications from mechanical parts and electronics to NC machining, planning and inspection, will be integrated into STEP soon. The contents of the initial STEP release are listed below:

STEP (ISO 10303) Initial Release

Part	Part Title
1	Overview and Fundamental Principles
11	EXPRESS Language
21	Clear Text Encoding of the Exchange
31	Structure
41	Conformance Testing: General Concepts
42	Product Description and Support
43	Shape Representation
44	Representation Structures
46	Product Structure Configuration

- 101 Visual Presentation
- 201 Drafting Resources
- 203 Explicit Drafting Configuration Controlled Design

The above documents may be ordered from the National Computer Graphics Association: Contact Nancy Flower at Phone: (703) 698-9600x325, FAX: (703) 560-2752, Email: ncga@cup.portal.com. For information on the activities of the STEP project, please contact Bradford Smith at NIST, Phone: (301) 975-3558, FAX: (301) 258-9749, Email: smithb@cme.nist.gov.

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Chairman's Observations

(continued from page 1)

Finally, after a long gestation period the first approved initial version of STEP is

now being released. This initial STEP standard, the result of thousands of professionals from many committees and nations is the first step toward a series of international standards for defining product data. A national symposium on the STEP standard will be held June 16-17, 1993 at Georgia Tech to introduce the STEP standards to a broader arena.

The above events indicate the increased recognition of information technology as a critical element to improved productivity. These efforts will help to develop new technology, improved processes and better cultural environments to help exploit information technology for design and manufacturing. The ASME Engineering Database Program continues to provide a platform within ASME to report new research results and industrial experiences in this important area.

*Robert E. Fulton
Chairman
ASME Engineering
Database Program*

EIGHTH ANNUAL ASME ENGINEERING DATABASE SYMPOSIUM

**Sponsored in Conjunction with the 1994 ASME Computers In Engineering Conference
Hyatt Regency, Minneapolis, Minnesota
September 11-14, 1994**

The purpose of the 1994 Symposium "Integrating the Engineering Enterprise," is twofold: publicize recent successes in implementing integrated engineering enterprise solutions for product conceptualization, design, development, and support, and to present research advances relevant to product engineering vital to the integrated engineering enterprise.

Topics of interest include (but are not limited to):

- Implementation experiences,
- CALS initiative and industrial enterprise integration programs,
- Implementation of STEP/PDES and other product exchange standards,
- Evaluation of database products,
- Engineering applications of object oriented database technologies,
- Engineering enterprise product and data modeling,
- Engineering enterprise performance, integrity, and security,
- Engineering image and document storage systems,
- Management of legacy systems in the engineering enterprise

Papers will be reviewed for presentation at the conference and publication in the conference proceedings. Two part papers will not be accepted. Four copies of the papers should be submitted directly to Peggy Bocks, Conference Chair, EDS, 5555 New King Street, Mail Stop 2068, Troy, MI 48098, (313) 695-7873, FAX: (313) 696-2590. Papers which are archive quality will be sent to Engineering with Computers, for potential publication.

ENGINEERING DATA MANAGEMENT: KEY TO TODAY'S GLOBAL MARKETPLACE

SEVENTH ANNUAL ASME ENGINEERING DATABASE SYMPOSIUM

Sponsored in Conjunction with the 1993 ASME International Computers In Engineering Conference & Showcase—August 9 & 10, 1993
Loews Coronado Bay Resort, San Diego, CA

The symposium is designed to publicize current applications and practices in implementing engineering data management strategies for product conceptualization, design, development and support, and to present research advances relevant to product engineering that are vital to survival in the competitive global market environment.

DATABASE SYMPOSIUM PROGRAM

MONDAY, AUGUST 9, 1993

02:00 pm–05:00 pm

TUTORIAL: FUNDAMENTALS OF ENGINEERING DATA MANAGEMENT

This tutorial will address the fundamentals of engineering data management and cover proven information technology methodologies. A review of some popular data models and process modeling methodologies will also be presented.

Instructors:

Prof. R. FULTON, Georgia Institute of Technology
Dr. R. RANGAN, Structural Dynamics Research Corp.

Topics:

Fundamentals of Engineering Data Management
Data Models
Process Modeling Methodologies
Semantic Data Modeling Languages
STEP (Standards for the Exchange of Product Model Data)
PDES (Product Data Exchange using STEP)
CALs (Computer-Aided Acquisition and Logistics Support)

TUESDAY, AUGUST 10, 1993

08:30 am–10:00 am *GENERAL SESSION:*

KEYNOTE ADDRESS: Mark Noneman; Senior Staff Engineer;
TRW—Military Electronics and Avionics Division

10:30 am - 12:00 nn *TECHNICAL SESSION DB1:*
PRODUCT DATA EXCHANGE STANDARDS-PDES/STEP/EXPRESS

Chair: I. MINIS, University of Maryland

Title: *Data Probe - A Tool for Express-based Data*
K.C. MORRIS, NIST

Title: *A Client/Server Implementation of the Design Process Using PDES/STEP "Level 3" Data Sharing Architecture—*
E. EDWARDS-IWE, Rolls Royce, Inc.

Title: *The Implementation of STEP Schemas—*W.C. BERKETT, Product Data Integration Technologies, Inc.

Title: *The STEP Integration Information Architecture—*Y. YANG, W.C. BURKETT, Product Data Integration Technologies, Inc.

Title: *Tight Integration and Synchronization of Graphical Applications—A New Approach to Distributed Design Environments—*W. MUELLER, B. KLEINJOHANN, Cadlab, Bahnhofstr, Germany

01:30 pm - 03:00 pm *PANEL SESSION DB2:*

PDM—A CHANGING TECHNOLOGY

Chair: E. MILLER, CIMdata

03:30 pm - 05:00 pm *TECHNICAL SESSION DB3:*

INFORMATION AND PRODUCT MODELS

Chair: A. BRONSKI, IBM Corporation

Title: *Information Management Support for Integrated Design Environments—*D. MAJUMDER, Georgia Institute of Technology; R.M. RANGAN, Structural Dynamics Research Corp.; R.E. FULTON, Georgia Institute of Technology.

Title: *Data Fusion for Adaptive Control in Manufacturing: Impact on Engineering Information Models—*O.H. BRAY, Sandia National Laboratories

Title: *Modeling Evolving Product Data for Concurrent Engineering—*K.J. CLEETUS, West Virginia University

Title: *Structural Integrity System Based on an Object-Oriented Activity and Product Model—*M. LOVSTAD, Det Norske Veritas Research AS; T.G. SYVERTSEN, The Norwegian Institute of Technology

Title: *Product Models in Simultaneous Engineering—*O. TEGEL, Technical University of Berlin

WEDNESDAY, AUGUST 11, 1993

10:30 am - 12:00 nn *TECHNICAL SESSION DB4:*

LEADING EDGE APPLICATIONS IN ENGINEERING DATA MANAGEMENT

Chair: P. BOCKS, EDS

Title: *IBM's NAVFAC Modeling and Drawing Management System—*A. GOLDSCHMIDT, IBM Industrial Sector Division

Title: *Designing the Future: DDG 51 Class Computer Aided Design—*J.J. OUILLETTE, U.S. Dept. of the Navy

Title: *COMSUBLANT Pump and Valve Repair System—*J.B. MUELLER, Arthur D. Little, Inc.

Title: *Automation of Wind Pressure Computation Using a Data Management Approach—*Y. GOURISHANKAR, F. WEISGERBER, University of Cincinnati

Title: *Engineering Database Implementation Experiences—*S. LEINHARDT, FORMTEK, INC.

01:30 pm - 03:00 pm **TECHNICAL SESSION DB5:**
MANAGEMENT OF ENGINEERING DOCUMENTS, SOFTWARE AND MATERIAL INFORMATION
 Chair: V. SAXENA, IBM Corporation
 Title: Developing and Implementing a Conceptual Computing Materials Design Database—W.J. RASDORF, L.K. SPAINHOUR, NCSU
 Title: Product Standards Data System: For Online Document Management—A. PIYARALI, Andersen Consulting
 Title: Engineering Software Quality Management and ISO 9000—S.J. SCHOONMAKER, Dresser-Rand
 Title: Engineering Process Management System—K. BUCKLEY, SYSCON
 Title: Review: An Information Management System for Informal Design Data—C.A. McMAHON, D.J. PITT, Y. YANG, J.H. SIMS WILLIAMS, University of Bristol

03:30 pm - 05:00 pm **TECHNICAL SESSION DB6:**
DATABASE SUPPORT FOR ENGINEERING ENVIRONMENT
 Chair: R. RANGAN, SDRC
 Title: Developing Design Solutions Using the Frames Technique of Knowledge Representation—T.R. WYATT, North Carolina State University; H. HOLTZ, Carleton University, Canada; W.J. RASDORF, North Carolina State University
 Title: A Logic Based Mechanical System Constraint Model—J.K. WU, J.H. WANG, C.X. FENG, T.H. LIU, The University of Iowa
 Title: Modeling Enterprise Information and Enabling Access Using Information Sharing Server—R. KARINTHI, V. JAGANNATHAN, V. MONTAN, J. PETRO, M. SOBOLEWSKI, R. RAMAN, G. TRAPP, S. DENG, G. ALMASI, X. LI, and G. TRAPP, West Virginia University
 Title: Heterogeneous Distributed Data Storage for an Object-Oriented Engineering Design—L.P. BRINTLE, E.A. KOPPES and J.K. WU, The University of Iowa
 Title: Integration of Knowledge-Based Systems and Heterogeneous Databases in Design Information Systems—Y. YANG, J.H. SIMS WILLIAMS, C.A. McMAHON and D.J. PITT, University of Bristol

CONFERENCE LOCATION/HOTEL RESERVATIONS: All conference and exposition activities will be held at San Diego's Loews Coronado Bay Resort Hotel, 4000 Coronado Bay Road, Coronado Island, CA (Telephone: 619.424.4000)... just 20 minutes away from Lindbergh International Airport.

ADVANCE REGISTRATION: To register by phone, call toll free: 1.800.843.2763 ext. 414. Have your credit card ready! To be eligible for advance registration discounted fees, registration and payment must be by Monday, August 2, 1993.

CONFERENCE PROCEEDINGS: The ASME International Computers in Engineering Conference and Database Symposium '93 proceedings will be available for separate purchase at the conference. They may also be purchased as part of your conference registration fee. At the conference, special prices will be in effect. Proceedings will be available for purchase following the conference through the ASME Order Department, but not at the reduced conference rates. Conference volumes may be ordered after the conference by contacting the ASME Order Department, 22 Law Drive, P.O. Box 2300, Fairfield, NJ 07007-2300 or calling 1.800. THE. ASME. Payment must accompany order by check or credit card.

TRAVEL ARRANGEMENTS - SPECIAL AIRFARES: ASME has appointed Thomas Cook Travel Co. as its official travel management company. For information and reservations, please call 1.800.222.ENGR within the U.S. All other locations should call 212.629.1375. Ask for the ASME Coordinator, identify yourself as a participant in the 1993 International Computers in Engineering Conference, and the agent will assist you.

All Conference Attendees Must Register & Pay the Appropriate Fee. (This includes all ASME members, non-members, authors, panelists, chairpersons & vice chairpersons.) To qualify for discounted registration fees, you must be a member of ASME or a reciprocal societies. On-site registrants must present a current membership card from ASME or a reciprocal society to qualify for the member rate.

REGISTRATION FEES

	Full Fee*		Proceedings**		One-Day Fee***	
ASME Member and/or Reciprocal Society Member	MBR1	470.00	MBR2	\$600.00	MBR3	325.00
Author/Panelist	AUP1	470.00	AUP2	600.00	AUP3	325.00
Chairperson (Member)	CHM1	470.00	CHM2	600.00	CHM3	325.00
Vice Chairperson (Member)	CHV1	470.00	CHV2	600.00	CHV3	325.00
Non-Member	NMB1	550.00	NMB2	680.00	NMB3	405.00
Retired Member	RTAM	5.00**				
Past President	PPST	N/C**				
Spouse		SPES				N/C**
ASME Student Member	STND	N/C**				

Ticketed Events:

Additional Tuesday Awards Luncheon Ticket TALT \$30.00
 Proceedings Volumes (3) COPV \$130.00
 Tutorial: Computational Fluid Mechanics on PCs CFMP \$30.00
 Tutorial: Neural Networks in Engineering NNIE \$30.00
 Tutorial: UNIX vs Windows UVWW \$30.00

* Member and non-member fees include 3 days of technical sessions, (1) opening reception & luncheon ticket only.

** Member and non-member fees include 3 days of technical sessions, (1) opening reception & luncheon ticket; all proceedings volumes.

*** Member and non-member one day fees include 1 day of technical sessions only.

NOTE: There is a \$25 surcharge for on-site registration.