

# PDM Tool Selection and Integration and the Migration of Legacy Data in a PLM Environment

Nathan W. Hartman, Ed.D. & Craig L. Miller, Ph.D.

Purdue University

[nhartman@purdue.edu](mailto:nhartman@purdue.edu) [miller02@purdue.edu](mailto:miller02@purdue.edu)

765-496-6104 765-494-8207

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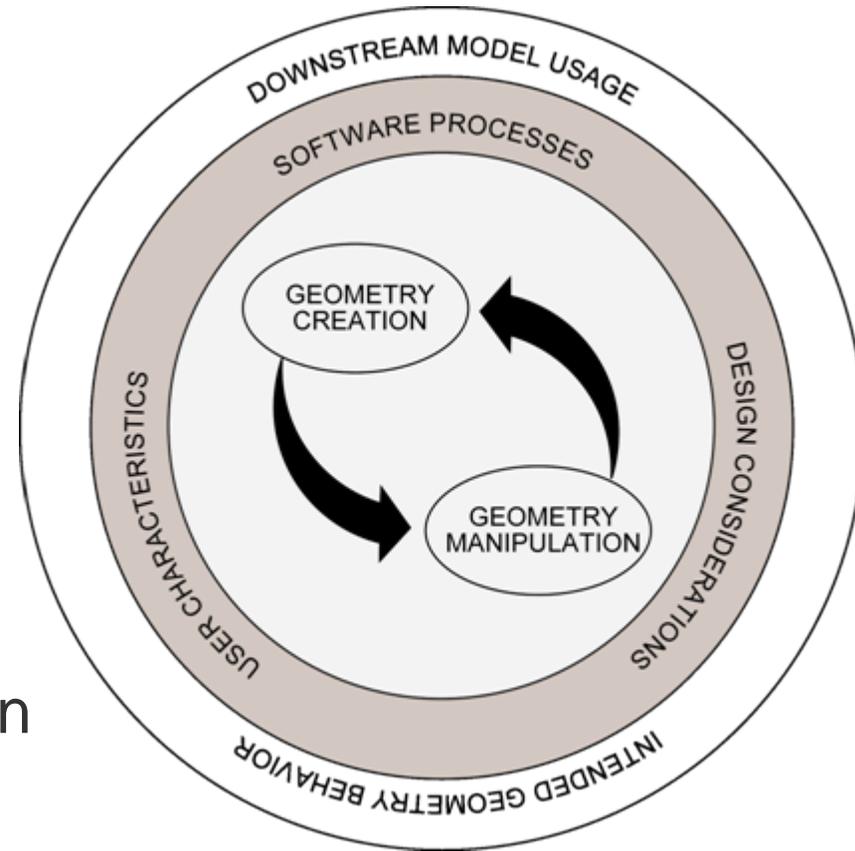
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# Computer Graphics Technology

- 475 undergraduate majors and 52 graduate students. (M.S. & Ph.D.)
- 20 full-time faculty teach over 40 computer graphics courses to over 4000 students.
- Our mission is to prepare the nations best practitioners, managers, and leaders in applied computer graphics.

# Curriculum Backbone for PLM

- 3D Constraint-based Modeling
- Surface Modeling
- Graphics Standards for Product Definition
- Product Data Management
- Industrial Applications of Simulation & Visualization



# Introduction

- A variety of data exists from multiple disciplines in the design of complex products.
- Managing this data (and the variety of types) is difficult.
- PDM tools support this process and form the back bone for PLM environments.

# Introduction

- Organizations are investing *billions* of dollars into these technologies.
  - \$1.73B in 2004 industry-wide
  - Annual growth rate of 12% through 2008<sup>1</sup>
- Often these toolsets are developed by the same vendors that develop CAD systems
  - Good for CAD/PDM communications
  - Inherent incompatibility between different systems.

<sup>1</sup>Amann, K. (2004). PDM to PLM: Evolving to the Future. *COE Newsnet*. Retrieved October 18, 2005, from [www.coe.org/newsnet/feb04/industry.cfm#1](http://www.coe.org/newsnet/feb04/industry.cfm#1).

# Introduction

- A change in vendors often results in the loss of years or decades worth of data
- Organizations are often “forced” to stay with a particular vendor’s toolset.
- The dynamics of selecting and implementing these technologies have become an ongoing consideration.

# Participants

- Ten companies selected
- Multiple global design locations
- Industry sectors represented:
  - Aviation / aerospace → commercial and military
  - Automotive
  - Automotive supply chain → Tiers 1 and 2
  - Heavy equipment
  - Agricultural equipment
- Represent functional implementations of PDM toolsets

# Methodology

- Due to open-ended nature of the problem, semi-structured interview format was used for data collection.
- 12 questions, multiple parts.
- Conducted over a period of 3 weeks in Summer 2005.
- Participants held managerial or senior staff positions in engineering and/or IT departments.

- The findings contain these common elements:
  - PLM implementation timelines and mitigating factors,
  - selected PLM toolsets,
  - data archival and migration strategies, and
  - training

# Findings

- Each revision or implementation of a new tool set typically lasted for 2 - 4 years.
- Contributing factors:
  - Inconsistent user expertise
  - Customer requirements (internal and external)
  - Hardware and software maturity
  - Corporate vision and strategy (or lack thereof)
  - Inconsistent funding
  - Necessity to “clean” the data

# Findings

- 8 out of 10 companies have experienced a change in vendors during their PLM implementation process.
- Some issues hindering the process are:
  - Parent company required change to common CAD system.
  - Lack of data exchange between old and new tools.
  - Loss of accuracy in CAD (surface) data.
  - Time and cost devoted to maintaining internally-developed tools.

# Findings

- 7 out of 10 companies simply upgraded to a new version of their existing PLM tool sets.
- Some issues associated with that update were:
  - In CATIA, there was data compatibility issues between V4 and V5 → re-modeled objects.
  - Interface between commercial and internal tools was problematic.
  - Decentralized corporate structure and unique processes between divisions made “lessons learned” difficult to apply.
  - Several companies lacked a valid model for change management.

# Findings

- 7 out of 10 companies had to continue using their legacy systems for some period of time.
- 5 out of 10 companies must continue to maintain their legacy systems due to business and market requirements.
- Most companies however are using (and converting) their legacy on an “as-needed” basis.
  - Typically when it coincides with its use on a new or modified product.

# General Project Observations

- Generally, each company developed a working group representing key groups to build consensus.
- Typically, not all data was migrated – only active (released) products and any legacy as needed.
- Databases were generally arranged by employee role or by product – archived at least weekly.
- Workflow in the PDM tool typically mirrored manual releasing process at first.

# General Project Observations

- Files were typically moved on a by-project or workgroup basis – generally numbered in the thousands.
- Most data needed to be “cleaned” prior to migration.
- In all cases, new product data was done entirely in the new system.
- Migration to the new system was typically strategic in nature:
  - increased functionality.
  - new product introduction/product modification.

# Lessons Learned in Migration Process

- Have a champion at each level, especially upper management.
- Make sure critical personnel are involved in the process.
- Communicate the successes and failures of the project with *everyone*.
- Develop a thorough process/strategy for migration.
- Corporate standards are critical.

# Lessons Learned in Migration Process

- Customize the tools as little as possible.
- Corporate culture must accept the new tools – change your mindset.
- These tools will have an impact on *how* people work and on the design process.
- Find a set of “early adopters” and use them to pilot the major stages of implementation.

# Implications for Industry

- Issues affecting implementation:
  - software and hardware maturity,
  - level of planning done,
  - and (in)consistent funding and resources.
- The PLM toolset implementation must coincide with business processes.
- Develop corporate standards for the creation and input of data into the PDM and PLM systems.

# Implications for Industry

- New PLM toolsets are often implemented in two ways – either by product group or by workgroup.
- The actual migration of data from one system to another (whether it is with the same vendors tools or not) should be methodical and well planned.
- Do not short-change the training of personnel who will use these tools.

# Implications for Education

- Exposure of students to contemporary PDM toolsets aids job preparedness.
- Technological literacy in a common industrial tool.
- Impending commodity status of CAD tools and the role of PDM