Nathan Hartman, Ed.D.

PLM CENTER MEETING SPRING 2015

Agenda

- Welcome and Updates
- Finances
- Research Project Presentations
- Working Lunch → Strategic Discussions
- Cessna PLM presentation and tours
- Future research discusions

Finances

- See spreadsheet
- Note projection
  - Project commitments
  - Faculty fellows
- Potential new members

Curriculum

- IMST
- Professional education
  - PLMCP → virtual, instructor-led & self-paced
  - PTC training → virtual, instructor-led & self-paced
- Model-based definition
- Technical data packages

Faculty Research Projects

- Security:
  - ***Elisa Bertino –*** *Professor, Computer Science; Research Director of CERIAS; Director of Cyber Center, Discovery Park*
- Requirements:
  - ***Dan DeLaurentis*** *– Associate Professor, Aeronautics and Astronautics and Director, Purdue Center for Integrated Systems in Aerospace*
- Supplier/Supply Chain Metrics:
  - ***Thomas Brush*** *– Senior Associate Dean, Head, Department of Management, & Professor of Management (Strategic Management Area)*
- Model-based Definition:
  - ***Nathan Hartman*** *–Professor, Computer Graphics Technology and PLM Center Director*

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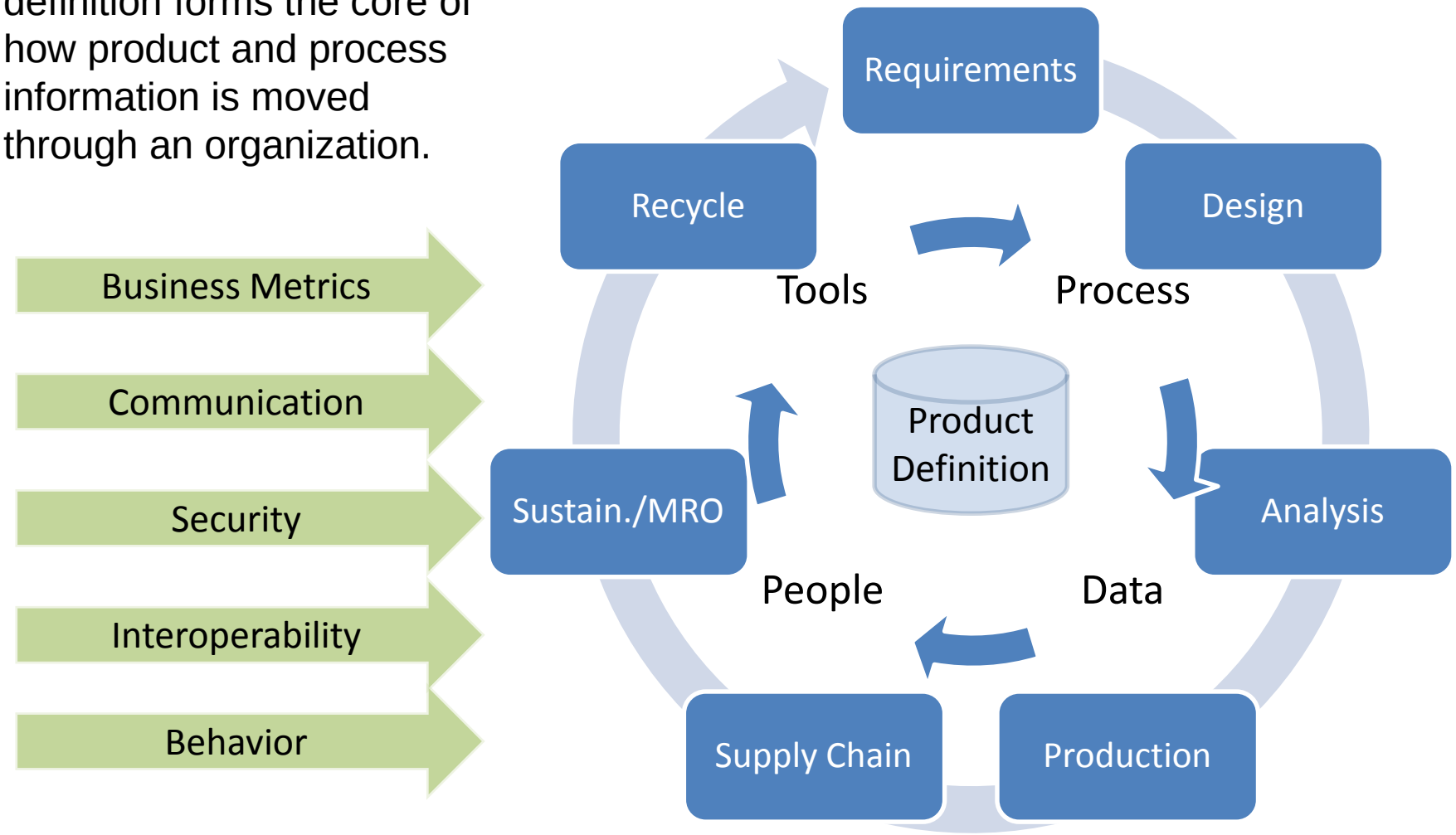
MODEL-BASED DEFINITION

DEFINING THE MINIMUM INFORMATION MODEL

What is PLM?

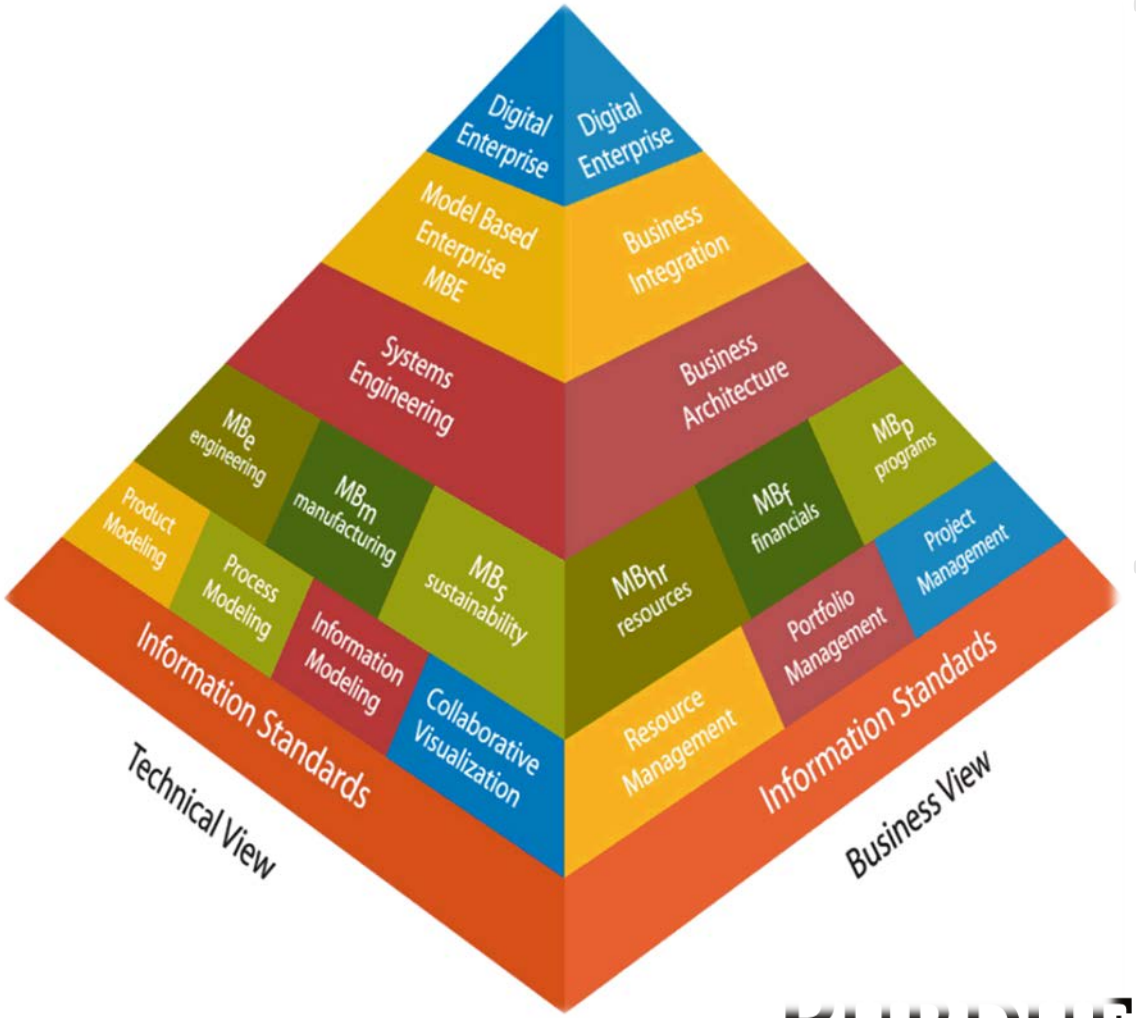
The digital product definition forms the core of how product and process information is moved through an organization.



PLM and the digital enterprise

Making PLM a business platform

- The merger and sharing of data between historical PDM and ERP systems to make a next-generation PLM platform.
- Real-time intelligence to deliver product data in context.
- Ontologies that drive product data interoperability that include behavior and context, as well as shape definition.
- A holistic model-based definition that can accurately and dynamically carry non-engineering attributes.
- Understanding the impacts of product data as a form of intellectual “currency” in the sociotechnical system.



Evolution of model-based representations

An exercise in information flow: right place, right form, right time

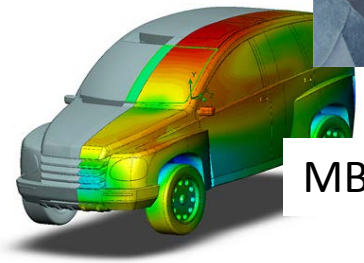
Geometry

Behavior

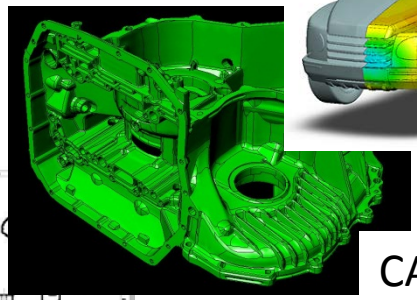
Context

Lifecycle based

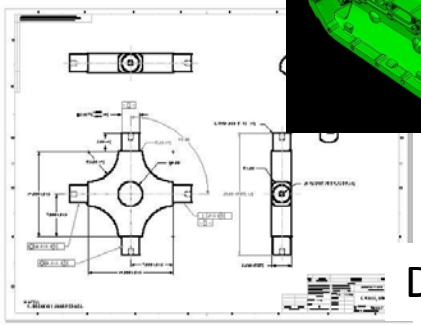
Virtual environment based



MBx based



CAD based



Drawing based

Increased sophistication in the digital product and process representations and their fidelity to the physical world.

Compelling Research Questions

- Based on the author/consumer communication model between functional roles, what is the minimum amount of data that is necessary to communicate to the next user/consumer in the lifecycle?
- What are the capabilities of the CAD tools for carrying that minimum amount of data?
- What are the capabilities of any neutral or derivative file involved in the process for carrying that minimum amount of data?

Background

- Author/Consumer
  - Info in/out
    - Product Information Model
      - » Who?
      - » What?
      - » When?
      - » Where?
      - » Why?
      - » How?
    - Historical Data
  - Organizational Structure
  - Current State/Future State
- CAD Capabilities
  - Commands
  - USERS
    - Strategic Use

Initial interview results

Survey Data Table

What information do you use from the drawing that you receive?	All information was used. Emphasis on dimensions and specifications, beginnings of the minimum information model.
What information are you supposed to use?	All of it. Participants did not indicate any difference between what is received and used.

Initial interview results

Does the drawing contain all of the information you need? If now, where else must you look for information you need?	Specifications were indicated as not being included with the drawing. Difficulty understanding Inaccessibility of the specifications Communication with design department in order to remedy specifications misunderstanding
What information from the drawing do you NOT use?	Participants never indicated information that was in excess. Either due to unconscious processing or fearing loss of necessary information
What is it that you are likely to produce using information from the drawing?	Component Designer Intent Manufacturability

Next steps

- Finalize questions
- Identify appropriate participants
- Release survey
- Characterize multiple workflows
- https://purdue.qualtrics.com/SE/?SID=SV_2u8SlQ78tgLCgRL&Q_Preview=1&Q_JFE=0&Preview=Survey

Working lunch discussion

- Indiana Manufacturing Competitiveness Institute (IN MaC) (outward facing; technology adoption; workforce education; infrastructure)
- Indiana Manufacturing Institute (facility)
- Digital Manufacturing & Design Innovation (DMDI) Institute (MBD)
- Institute for Advanced Composites Manufacturing Innovation (IACMI) (modeling and simulation; cloud based)
- GE (brilliant factory; MBD linked to materials)
- Lily Gift
  - Innovation Design Center ($13M)
  - Engineering Laboratories ($13.5M)
  - Zucrow Laboratory ($5M)
  - Active Learning Center ($5M)
  - Purdue Polytechnice Institute ($3.5M)
- Dauch proposal
- Professional education

Possible Research Topics 2015-2016

- Systems engineering
- Cybersecurity
- Supply chain
- Data management (attributes, files, metadata, etc.)
- Data to the shop floor
- PLM practice/user experience
- ERP
- Maintenance/sustainment