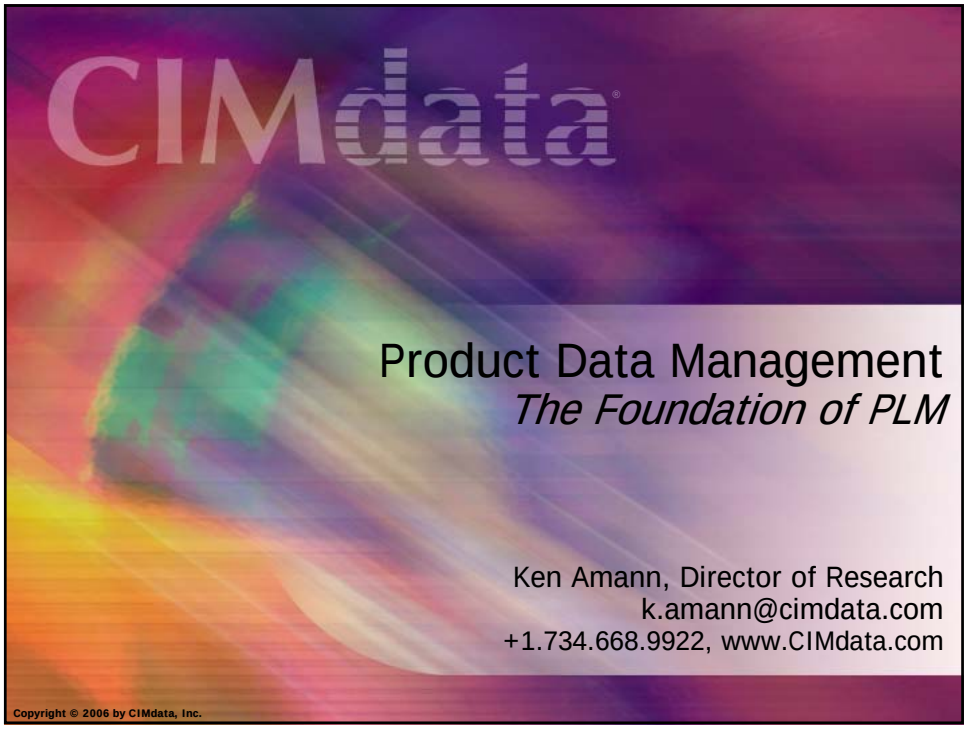
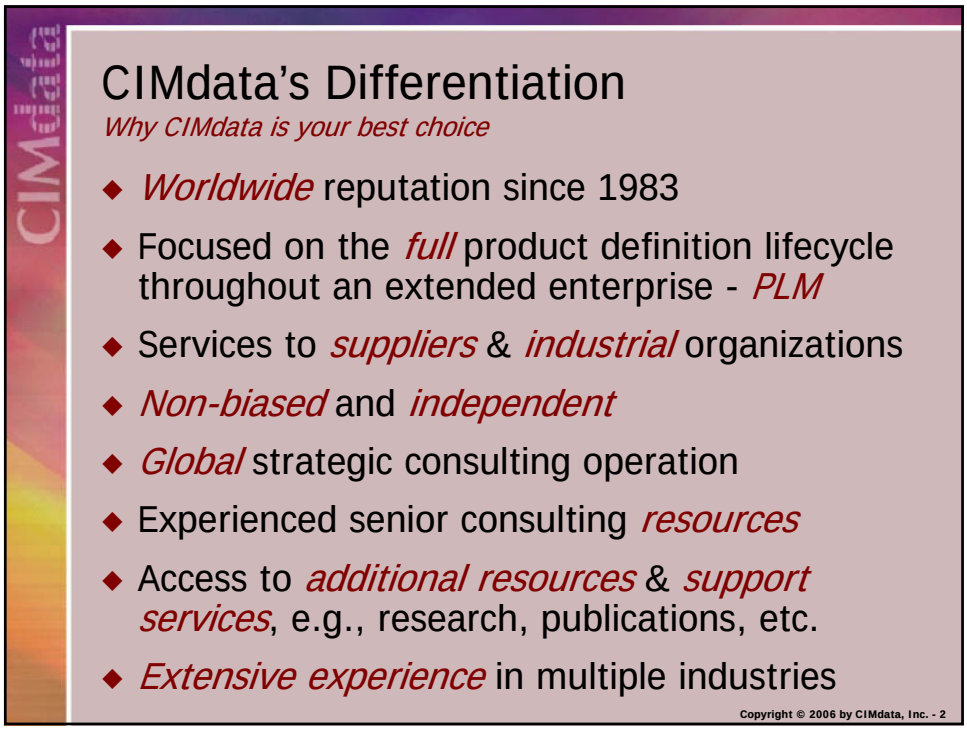
Product Data Management

PDM – The Foundation for PLM





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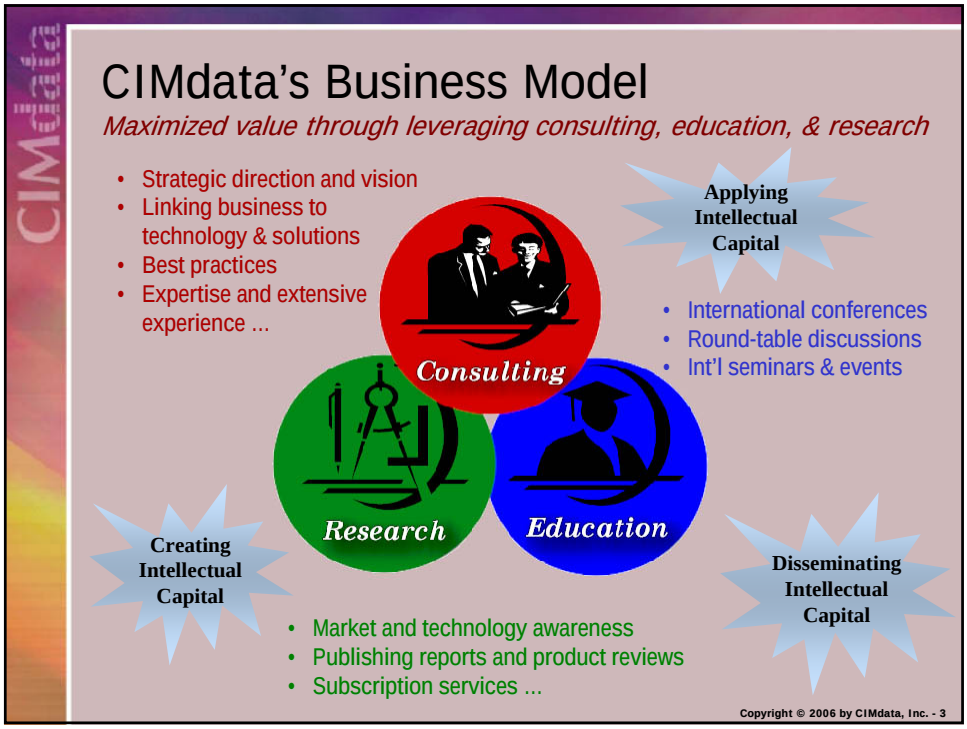
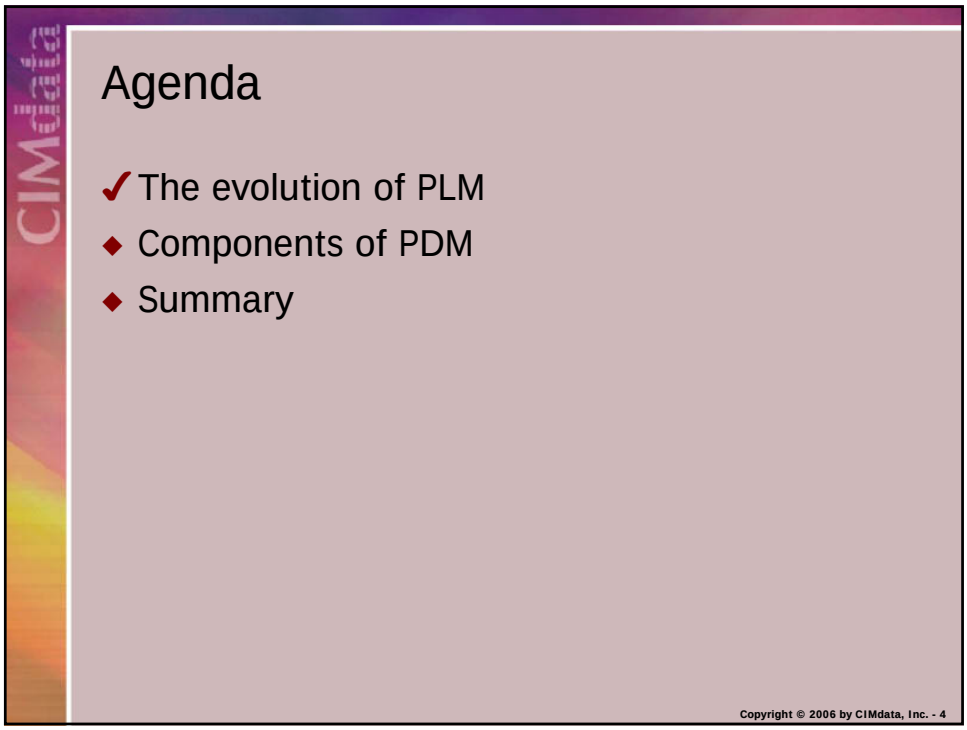




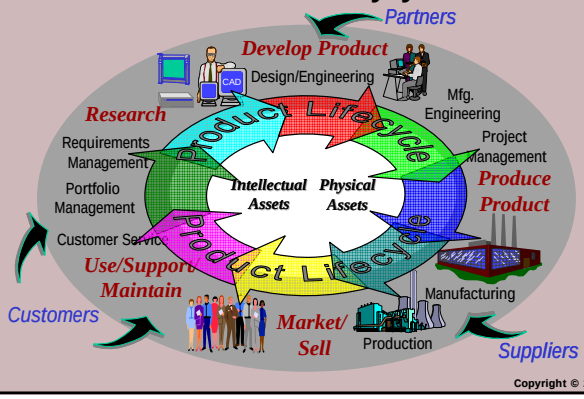
Product Data Management

PDM – The Foundation for PLM

Managing the Product Lifecycle

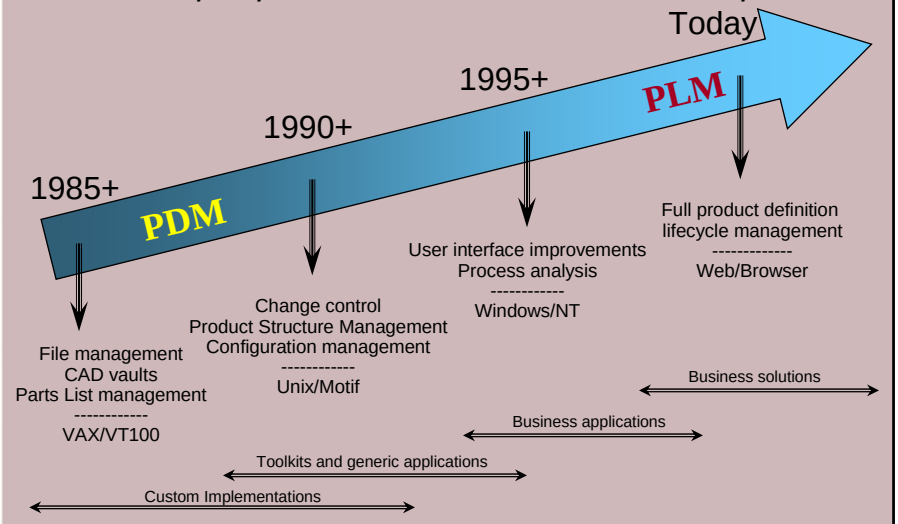
The primary business processes are not as simple as they once were

- Managing the product lifecycle is a critical business enabler
- Managing the product lifecycle has been the basic vision of PDM for many years



The Evolution of PLM Technologies

A historical perspective on PLM's focus and development



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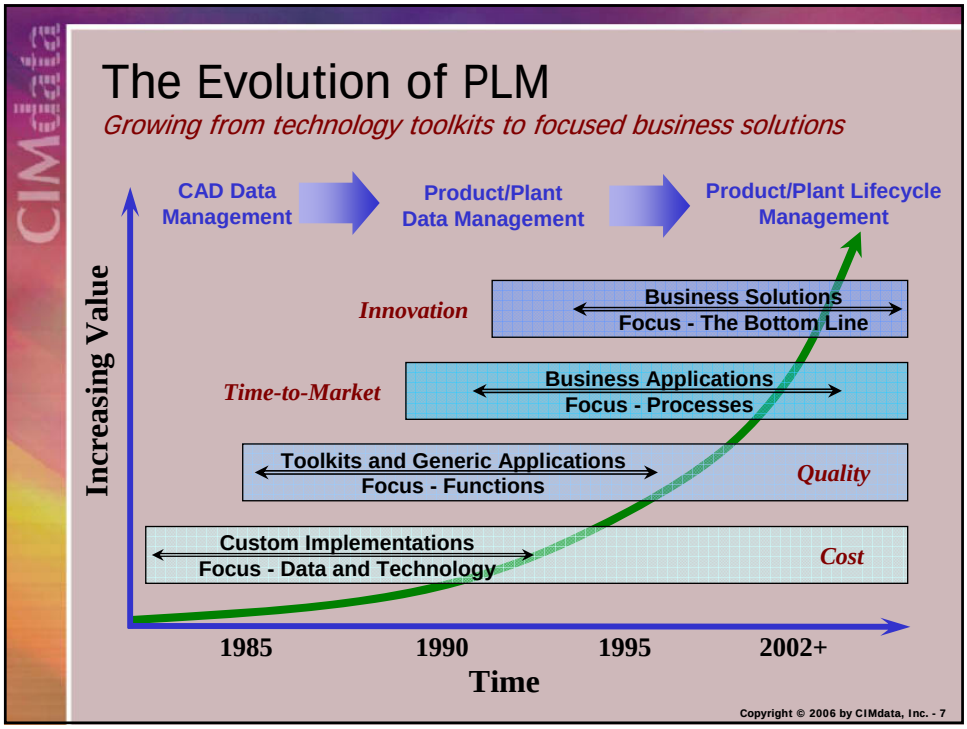

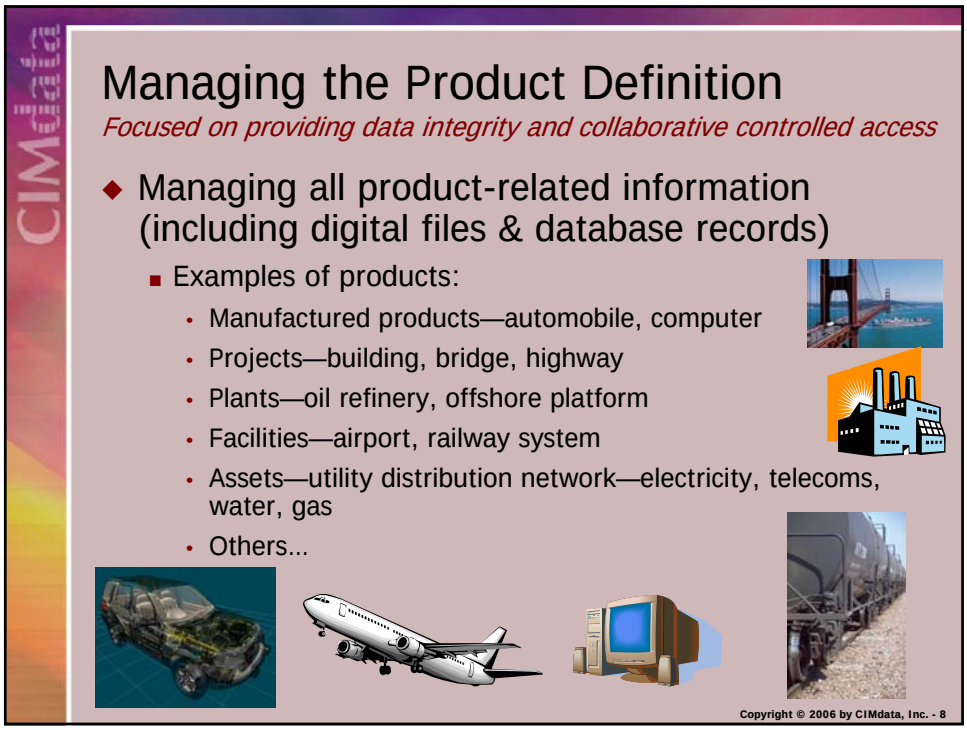

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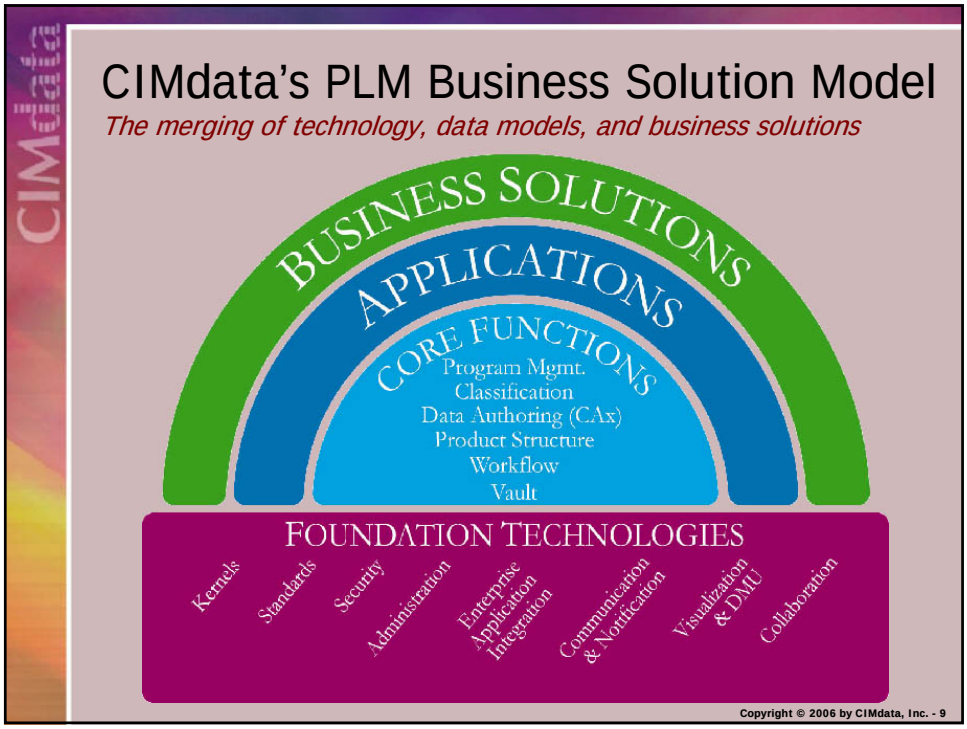
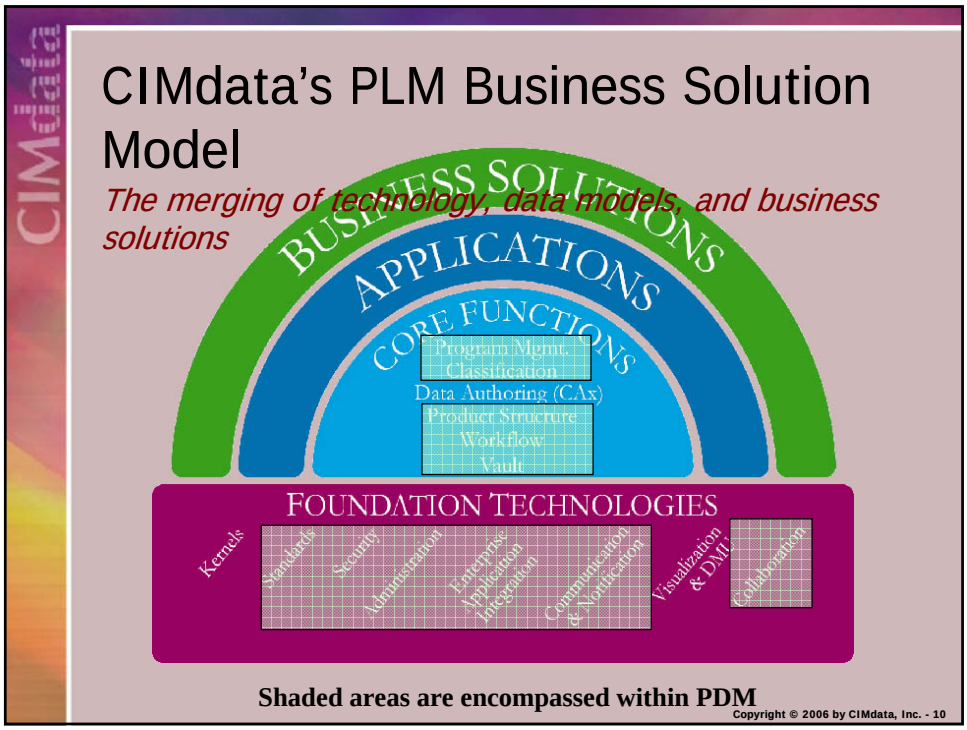




Product Data Management

PDM – The Foundation for PLM

PLM is Not Technology

PLM is a business approach that incorporates technology

PLM is focused on

How a business works

As well as

What is being created

And

How it will be used

The Core of PLM

Three fundamental PLM concepts

- Universal, secure, managed access to the definition of a product or plant
  - Information that "shapes" the product or plant
  - Information that is "derived" from the product or plant definition
- Maintaining the integrity of the product definition and related information throughout the life of the product or plant
- Managing and maintaining business processes used to create, manage, disseminate, share and use the information

"Shaping" Information

Examples of information used to define what a product will "be"

- Requirements
  - Functional
  - Performance
  - Quality
  - Cost
  - Physical
  - Interoperability
- Standards
- Regulations
- Technology
- Aesthetics

"Derived" Information

Examples of information used to describe what a product "is"

- Models, drawings and documents that describe the product or plant
- Analysis and test input and results
- Configurations and variation – structures and views
- Manufacturing and assembly instructions and processes
- Material and component requirements
- Maintenance and operations documentation
- Training documentation
- User guides and instruction
- Sales - options, variations
- Marketing collateral

Product Data Management

PDM – The Foundation for PLM

Process Focus

PLM manages processes across the extended enterprise

- Program and project management
- Processes required to manufacture the product or plant
- Operational processes
- Disposal or decommissioning processes
- PLM process management ensures complete digital feedback to both users and other business systems throughout each lifecycle stage

Components of PLM

What is included within PLM

- *Product Data Management - PDM*
- Collaborative Product Management
- Requirements management
- Portfolio management
- Product analysis
- Digital manufacturing
- Asset Management
- In-service data management to support MRO
- Product definition authoring
- Documentation authoring

Agenda

- The evolution of PLM
- ✓Components of PDM
- Summary

Product Data Management

Creating the foundation of PLM

- A set of technologies and capabilities that support information management throughout the product lifecycle
- Provides many of the critical core functions and foundation technologies within a comprehensive PLM solution
- PDM includes:
  - Information and document vaulting
  - Content and document management
  - Workflow and process management
  - Product structure management
  - Configuration management
  - Classification management

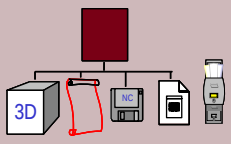
Product Data Management

PDM – The Foundation for PLM

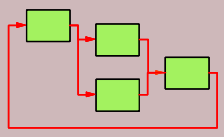
Core PDM Functions

Providing key elements for product definition management

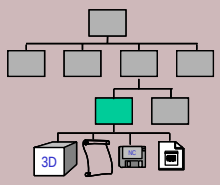
Data Vault & Document Management



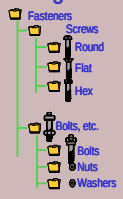
Workflow & Process Management



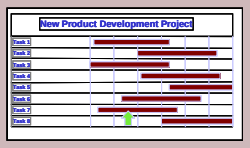
Product Structure Management



Classification Management



Program & Project Management



Why is PDM Fundamental to PLM?

PDM has always focused on data and configuration management

- PDM provides the infrastructure required to deliver the three fundamental characteristics of PLM
  1. Universal, managed access
     - Information vaults
     - Document and content management
     - Security
  2. Maintaining definition integrity
     - Product structure management
     - Configuration management
  3. Managing business processes
     - Workflow
     - Change management
     - Review and approval

Product Data Management

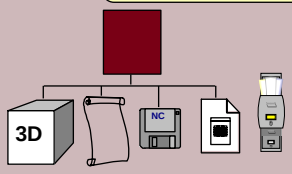
PDM – The Foundation for PLM

Data Vault & Document Management

Definition

- Data Vault and Document control
  - Secure data vault for all product information
  - Files (drawings, documents, etc.) managed as “objects”
  - Check-out and check-in control to ensure data integrity
  - File & hardcopy locations maintained and managed
- Part to Data relationships are managed
- Multiple release levels supported
  - Release states maintained
  - Versions and revisions
- Browsing and interrogation
  - By attribute
  - By full text retrieval (FTR)

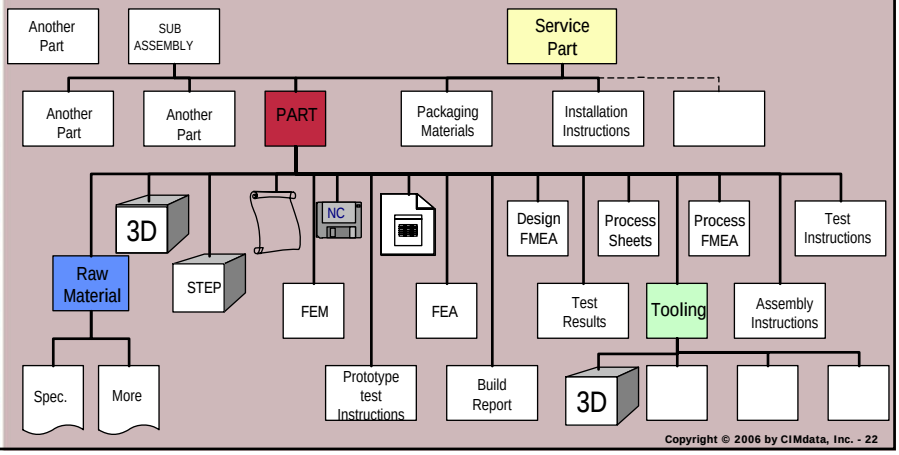
The digital equivalent of the Drawing Vault or Technical Library



Data Vault & Document Management

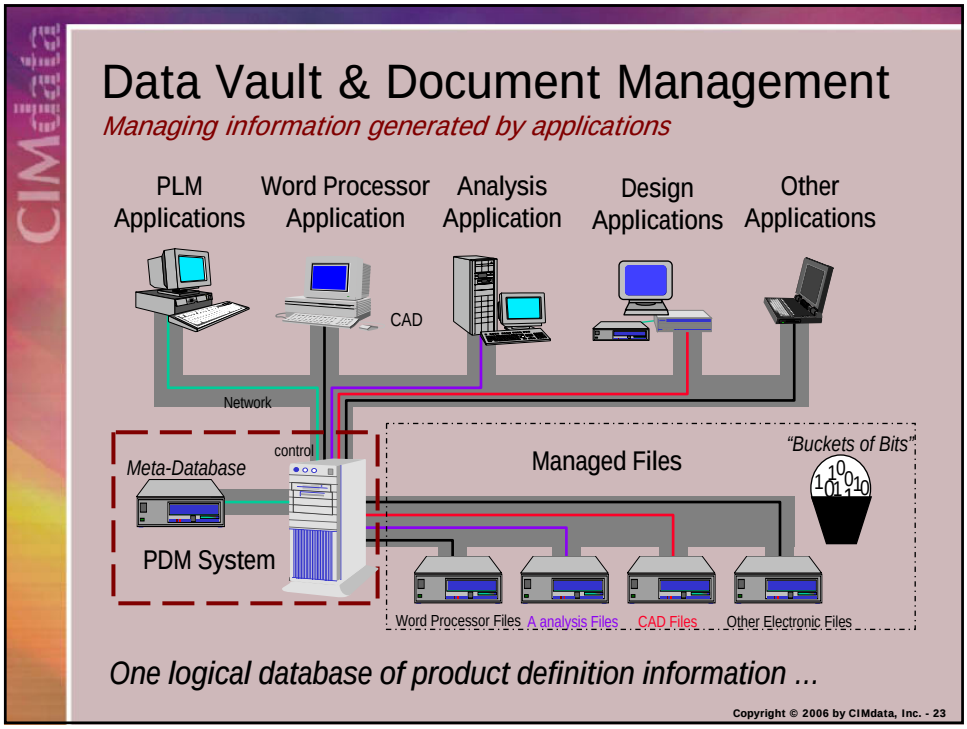
Products have many associated parts, documents, and files

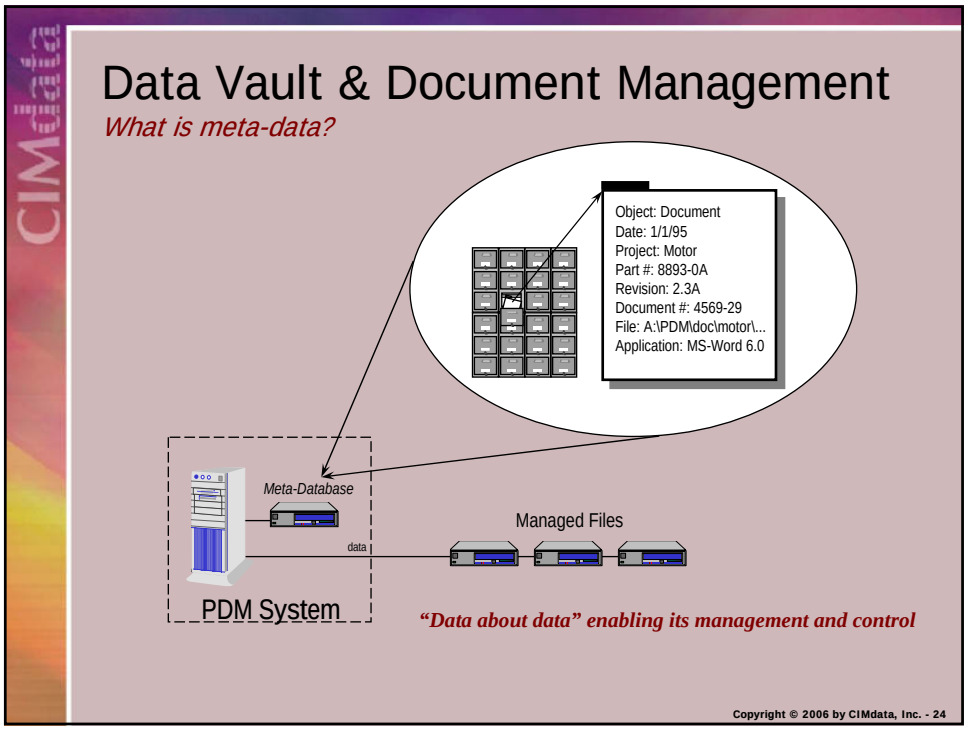
- Identification must be consistent & recognizable
- Many files may represent one logical object



Product Data Management

PDM – The Foundation for PLM





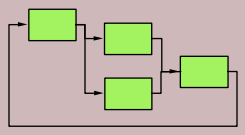
Product Data Management

PDM – The Foundation for PLM

Workflow & Process Management

Definition

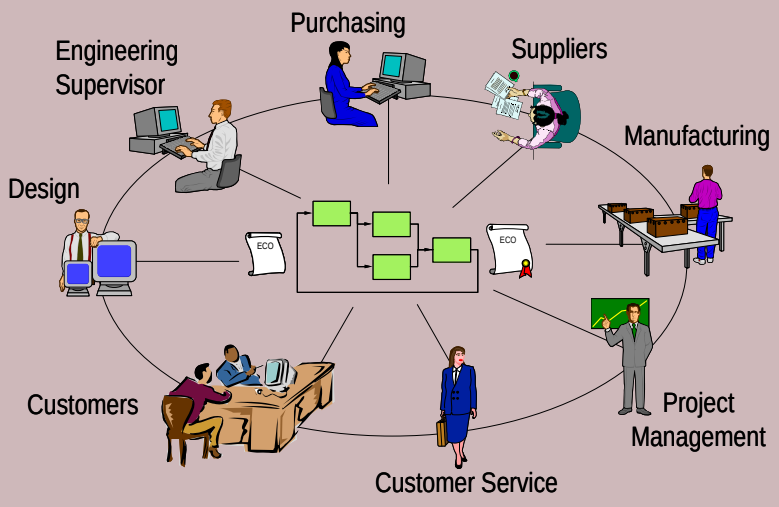
- Approved and automated workflow & processes
  - By project, status level, product type, ...
  - Sequential, parallel, conditional steps
  - Voting rules and time-outs
  - Folder/package maintenance
  - Notification and distribution
  - Audit processes and actions “triggers”
  - Notes and comments collected
- Process integration and change control
  - ECO definition and management
  - Change orders associated to product structures
- Ad-hoc workflow management
- Browsing and reporting



Allows the embodiment of your quality procedures & processes

Workflow & Process Management

Example: Engineering change orders (ECO) include many disciplines



Product Data Management

PDM – The Foundation for PLM

Workflow & Process Management

Examples of Workflow

- Document Production Cycle
- Engineering Change Requests (ECRs)
- Engineering Change Orders (ECOs)
- Design Release Management
- Problem Tracking and Resolution
- Bid Preparation
- Engineering Reviews
- Purchasing Cycle
- Contracts Management
- Update of Quality Plans & Procedures

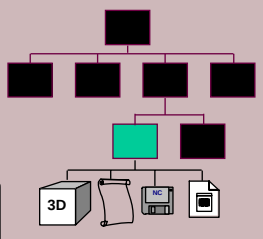
Distribution of data for use or comment/ annotation with automated control

Supports collaboration and concurrent activities

Product Structure Management

Definition

- Create and maintain:
  - Part-to-part, part-to-document, document-to-document ...
  - Compound document component relationships
  - Product components—including material, mechanical/ structural, electronic/electrical, software, & documentation
- Create and maintain configuration variations
  - Versions and effectivities
  - Options, alternates, substitutions
  - Multiple product structure views
- Browsing and reporting
  - Where-used
  - BOM explosions
  - Selective queries ...



More than a bill of materials!

Product Data Management

PDM – The Foundation for PLM

Product Structure Management

Integrate with other functions & business systems

- Configuration control supported by change processes
- BOM synchronization with ERP/MRP production systems
- Integrated with assembly models in CAD
- Analysis tools (cost roll-ups, ...)
- Other PDM systems

Program and Project Management

Managing the resources needed to perform the work

- *Balances* the three key elements
  - Time, cost, and quality
- Functions include:
  - Task definition
  - Deliverables management
  - Milestone and progress reporting
  - Coordination and notification between individuals, teams and projects
- Aggregates and manages the multiple projects involved in a product's lifecycle

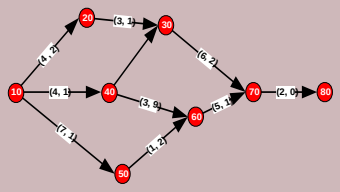
Product Data Management

PDM – The Foundation for PLM

Program & Project Management

Definition

- Model work breakdown structures (WBS)
- Assign WBS tasks with product structure
- Define WBS task schedules
- Allocate resources to WBS tasks
- Perform program analysis
- WBS browse/reporting

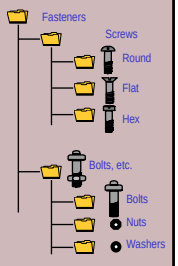


Project tracking is simplified by linking tasks with deliverables (via work packages & workflows)

Classification Management

Definition

- Maximize use of existing parts/assemblies
- Easy retrieve of standard parts/objects
- Location of similar parts/objects
- Industry & company-defined attributes
- Create/maintain classification schemes, attributes, codes, structures …
- Allocation of parts & components to classes & groups



Are You Re-Inventing the Wheel?

"Up to 80% of the work done in an engineering department is identical or very similar to work done previously."

From research by: Arthur D. Little

Classification Management

Business drivers and usage

- External parts and raw materials management
  - Reduce purchased part count and consolidate Suppliers
  - Use of standard classification systems, DIN 4000
- In-house parts design management
  - Part/process standardization and consolidation
  - Form, fit, and function classification
- Sales configurator and options management
  - Maximize variety
  - Minimize number of parts
  - Features and options with configuration rules
- Service and operations
  - Locate replacements and substitutes

Visualization and Collaboration

PDM is the foundation required for collaboration

- PDM provides an application neutral environment for visualization and collaboration
- Visualization facilities
  - Enable personnel without access to, or knowledge of, authoring tools to view, comment on, and use product information created by those tools
  - Expand the use and value of core product information
- Collaboration enables groups of users to work together in interactive work sessions or via shared information

PDM and Collaboration

PDM is an organized source for information

- PDM provides data and process management
- PDM manages:
  - Viewable versions of product information
    - These must be kept up-to-date when the data changes
    - PDM can trigger their creation upon data change
  - Reviews, markups and decisions
  - Product configurations
  - Release of product information to manufacturing
- PDM enforces data access control
- PDM defines and executes workflow
- PDM coordinates/integrates with other apps

Agenda

- The evolution of PDM
- Components of PDM
- ✓ Summary

Product Data Management

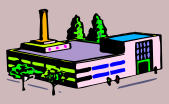
PDM – The Foundation for PLM

Benefits of PLM

Benefits for all areas of the business

1. For Business Performance and Opportunities

2. For the Organization



3. For the Users

4. For the Product or Service

5. For Process Performance

Business Performance Impact

Real life results from various companies

- ~40% improvement in product change cycle times
- 15 - 30% reduction in prototypes and 40% reduction in lead times
- 25% productivity increase in design engineering
- Reduced development time by 75%
  - From 18 months to 4 months for a household product
- Reduced time to cost a product from 5 days to 5 minutes
- Reduced an engineering review process by 83%
  - From 12 day to 2 days

Impacting Business Performance

PDM and PLM help improve:

- The *top* line
  - Operational efficiency and flexibility
  - Organizational capability
  - Product development
- The *bottom* line
  - Revenue and profits
  - Customer satisfaction and loyalty

Summary

PDM provides the foundation for creating effective PLM solutions

- PLM is a business necessity
- PDM was the genesis for PLM
- PDM provides the core functions that are the foundation for creating and deploying PLM solutions
  - Information access and sharing
  - Configuration and information integrity
  - Process management

Product Data Management

PDM – The Foundation for PLM