

# Managing Product Changes

## CIMdata PLM Leadership Webinar

PLM Leadership

## Managing Product Changes

CIMdata PLM Leadership Webinar Series  
4 August 2015  
#cimdatawebinar

John MacKrell, Vice President  
email: j.mackrell@cimdata.com  
Tel: +1.734.668.9922

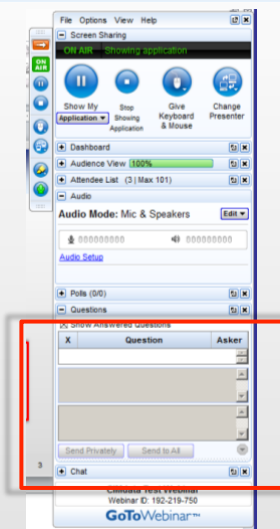
**CIMdata**® | Global Leaders in PLM Consulting  
www.CIMdata.com

Copyright © 2015 by CIMdata, Inc.

## Questions?

Please use the GoToWebinar Question panel

- Please enter questions in the GoToWebinar Question panel
- We will answer as many questions as time allows...
- Those that can't be answered live will be answered by email



The screenshot shows the GoToWebinar control panel. A red box highlights the 'Questions' section, which contains a table with columns for 'Question' and 'Asker'. Below the table are buttons for 'Send Privately' and 'Send to All', and a 'Chat' button at the bottom.

CIMdata  
Copyright © 2015 by CIMdata, Inc. 2

# Managing Product Changes

## CIMdata PLM Leadership Webinar

**Our Mission...**  
*Strategic management consulting for competitive advantage in global markets*

**CIMdata is the leading independent global strategic management consulting and research authority focused exclusively on the PLM market.**


**We are dedicated to maximizing our clients' ability to design and deliver innovative products and services through the application of PLM.**

 Copyright © 2015 by CIMdata, Inc.  3

**Presenters' Profile**  
*Your presenters' professional background*

- John MacKrell, Vice President
  - More than 40 years of experience in the application of computer-based solutions to engineering & manufacturing; has held senior positions in product management, marketing, research & development, and consulting with companies that produce PLM solutions & services
  - B.S. in Naval Architecture & graduate-level studies in computer science



 Copyright © 2015 by CIMdata, Inc.  4

# Managing Product Changes

## CIMdata PLM Leadership Webinar

### Key Takeaways

*What you should learn today*

- What the issues are that impact changes
- What the benefits of working in the context of a single source of truth are
- How PLM helps external partners streamline their role in change processes
- How to use PLM to create a rational approach to managing change
- What some of the best practices are when implementing change management in your organization



Copyright © 2015 by CIMdata, Inc.



5

### Agenda

- What are Change & Configuration Management
- Key Change Process Issues
- Best Practices for Change Processes
- Using PLM to Support Best Practices



Copyright © 2015 by CIMdata, Inc.



6

# Managing Product Changes

## CIMdata PLM Leadership Webinar

### What is Configuration Management?

#### ICM definition

- Configuration Management
  - Establishing and maintaining the definition and status of products and their components, all associated information and the relationships among them
  - Managing all changes to any product, component or defining documentation in an auditable, repeatable, verifiable, controlled manner
  - Keeping track of what you design, develop, deliver, sell, and support

***Configuration Management is the process of managing products, facilities, and processes by managing their requirements, including changes, and assuring conformance in each case.***

The Institute of Configuration Management



Copyright © 2015 by CIMdata, Inc.



7

### What is Configuration Management?

#### CMPIC Definition



Configuration Management is a set of inter-related processes, management techniques, and CM supporting tools that assures:

- (1) Our products, facilities, IT Systems, services, processes, etc., are **what they are intended to be**.
- (2) That **changes** to our products, facilities, IT systems, services, processes, etc. are **properly evaluated, authorized and implemented**.
- (3) That **all information** necessary to define and manage our configurations and data is kept:
  - (a) **current and accurate**.
  - (b) is **structured** for all users needs and,
  - (c) is readily **available** to all who need to know.

Copyright 2008-2011 CMPIC LLC, used with permission



Copyright © 2015 by CIMdata, Inc.



8

# Managing Product Changes

## CIMdata PLM Leadership Webinar

### Configuration Management Benefits

*Why you should spend the time and money to implement Config. Mgmt.*

- Provide measurable performance parameters
- Decisions are based on correct, current information, enhancing production repeatability
- Applicable data (such as procurement, design or servicing) is accessible, avoiding guesswork and trial and error
- Downstream surprises are avoided; significant cost and schedule savings can be realized
- Control the implementation of change (proactive & not reactive)—avoiding costly errors of ad-hoc, erratic changes
- Timely, accurate info. avoids costly delays & production down time; ensures proper replacement and repair



Copyright © 2015 by CIMdata, Inc.



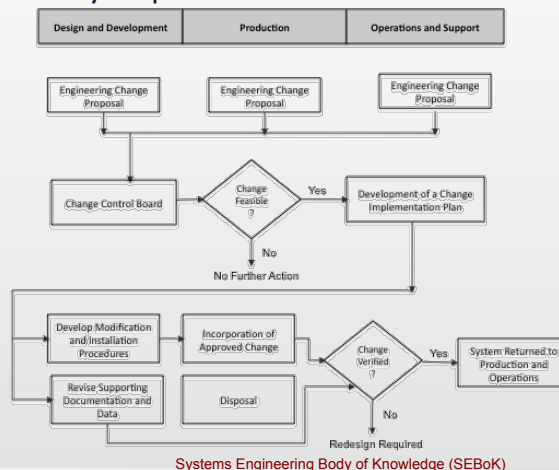
### What is Change Management?

*We use Change Management processes to manage changes to configurations*

- A methodology to manage changes to the product configuration during its lifecycle process

- Enforce:

- Standard processes
- Traceability
- Completeness
- Validity
- Approval



Systems Engineering Body of Knowledge (SEBoK)



Copyright © 2015 by CIMdata, Inc.



# Managing Product Changes

## CIMdata PLM Leadership Webinar

### Change Management

#### *Primary concepts*

- Managing change is critical to controlling product evolution & product configurations
- We need changes to fix things & to improve things & for many other reasons as well
- Configuration Management is the framework in which changes take place
- Changes come from internal as well as external sources
- Change Management begins at the start of the product life cycle & continues throughout the life cycle
- Changes need to be managed & tracked from start to finish



Copyright © 2015 by CIMdata, Inc.



11

### Key Change Concepts

#### *As espoused by the ICM*

- Encourage change
  - Keep changes small and simple to minimize required approvals & time lags
- 3 steps—change request, change order, change notification
  - Consider adding 4th step, problem report, to the beginning to allow anyone, including customers and suppliers to submit issues.
- Lead the process with documentation—what the change is intended to accomplish, why, how, cost



Copyright © 2015 by CIMdata, Inc.



12

# Managing Product Changes

## CIMdata PLM Leadership Webinar

### Agenda

- What are Change & Configuration Management
- Key Change Process Issues
- Best Practices for Change Processes
- Using PLM to Support Best Practices



Copyright © 2015 by CIMdata, Inc.



13

### Business Issues Driving Change

*Managing change provides critical support (1 of 2)*

- More effective control of product development, product production, sales & marketing, and support & maintenance
- Support use of global virtual teams
  - Controlled access to clear, concise & valid shared product information
- Agile design and manufacturing
  - Rapid change impact analysis
  - Better able to standardize parts
  - Higher design reuse
  - Reduce part complexity
- Reduce downstream changes
  - Less scrap and rework



Copyright © 2015 by CIMdata, Inc.



14

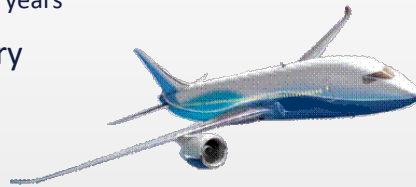
# Managing Product Changes

## CIMdata PLM Leadership Webinar

### Business Issues Driving Change

*Managing change provides critical support (2 of 2)*

- Maintain extended lifecycle products
  - Changes to update airframes and avionics to extend life and increase efficiency of aircraft for 30 to 50+ years
- Control & support regulatory compliance & safety
- Product liability
  - Evidence of due care & diligence
- Drive for mass customization & personalization drives more product configurations (variations)



Copyright © 2015 by CIMdata, Inc.



### Why You Need Change Management

*Audit findings from many businesses – do you recognize any of these?*

- Changes “pushed out” without proper authorization
- Not all changes are being tracked
- Baselines not established or not being updated
- The right people are not involved in the change process
- Full impact of change unknown first time around
- Thorough change evaluation not being done
- Traceability is weak
- Change process takes too long
- Metrics not being tracked or reported
- Personnel working on the wrong Information



Copyright © 2015 by CIMdata, Inc.





# Managing Product Changes

## CIMdata PLM Leadership Webinar

### Change Process Failures

*What causes change processes to fail (1 of 2)*

- Change is too tightly controlled during WIP
  - Data is left vulnerable, outside control of the PDM vault
  - People work around the process
- All changes are treated equally
  - Process is delayed due to over complication
  - Different levels of changes should receive different levels of control and sign-off—more complicated or costly—more control
- The process is not “closed loop”
  - The person who requested the change needs to know it was resolved
  - Other people need to be notified as well



Copyright © 2015 by CIMdata, Inc.



17

### Change Process Failures

*What causes change processes to fail (2 of 2)*

- Changes are not always tracked against all of the data they impact, such as labeling, artwork, and packaging
  - Change is incomplete
- Change process is complicated when external partners have to be involved in decision making
  - Fail to gain complete understanding of change impact
  - Companies do not provide external partners enough access
- Determining the cost of a change is often difficult—many times people lack access to cost data
  - Changes delayed due to fear of costly mistake
  - Changes undertaken without understanding lifecycle cost



Copyright © 2015 by CIMdata, Inc.



18

# Managing Product Changes

## CIMdata PLM Leadership Webinar

### Evaluating Changes

*Questions you should ask:*

- Which products does the change potentially impact?
- Does the change impact security?
- Does the change offer value?
- What is the impact on cost?
- Is the inventory impact clear?
- Will the design have to be re-simulated or retested?
- Will part interchangeability, replaceability, or sustainability be effected?
- Do part suppliers need to be changed?
- Is there a regulatory impact from the change?
- Which documents are effected?
- How does the change impact performance and reliability?
- Does the change modify internal or external interfaces?
- How does the change impact the current work, scope, delivery, & schedule?
- Is compatibility with other parts impacted?



Copyright © 2015 by CIMdata, Inc.



19

### Thoroughly Understand the Impact

*Do not make a change without understanding its "cost" to the product*

- Formally analyze the impact of change on the product across the lifecycle and the supply chain
  - Including technical and commercial considerations
- Consider the following criteria when assessing a change:
  - Demand & sales
  - Cost & inventory
  - Regulatory compliance & validation (safety)
  - Manufacturing process changes
  - Impact on related product items (higher-level assemblies, item used in multiple products, fit & function...)
  - Reliability & performance
  - Packaging & labeling



Copyright © 2015 by CIMdata, Inc.



20

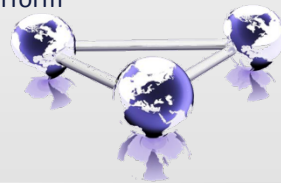
# Managing Product Changes

## CIMdata PLM Leadership Webinar

### Changing Part Number or Configuration

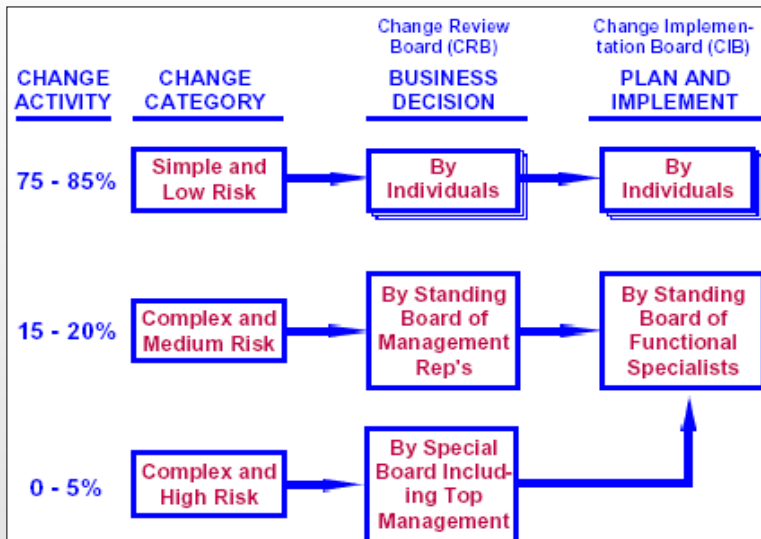
*What constitutes a required change*

- **Form**
  - The shape, size, dimensions, and other physical measurable parameters that uniquely characterize a product
    - For software, form denotes the language and media
- **Fit**
  - The ability of an item to physically (or programmatically) interface with or interconnect with or become an integral part of another item
- **Function**
  - The action or actions that an item is designed to perform
- **Traceability**
  - For products that are serialized or batch identified



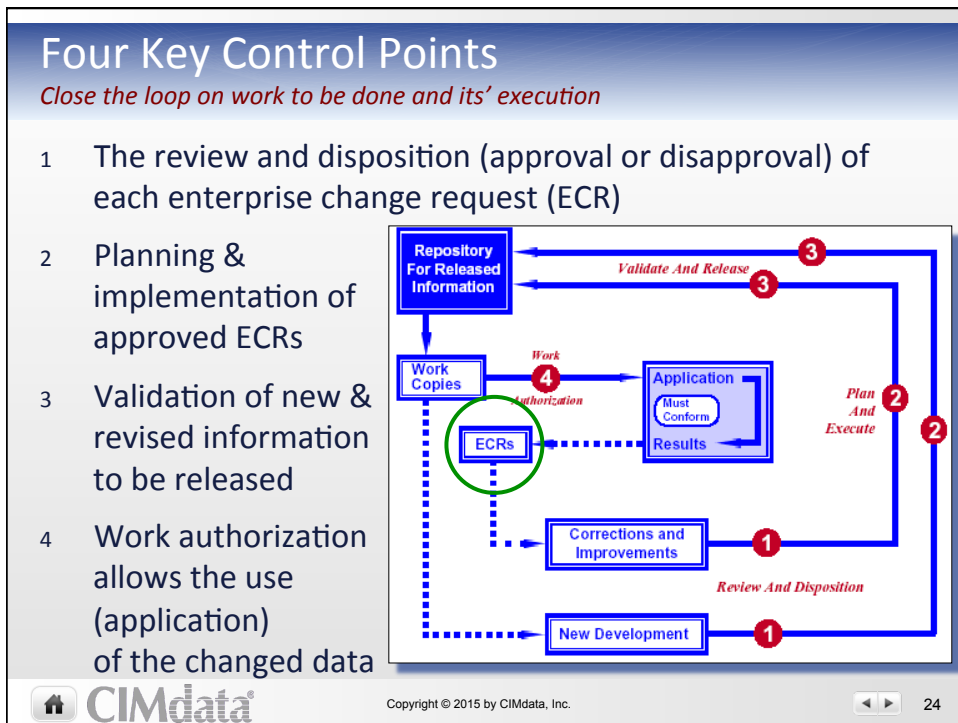
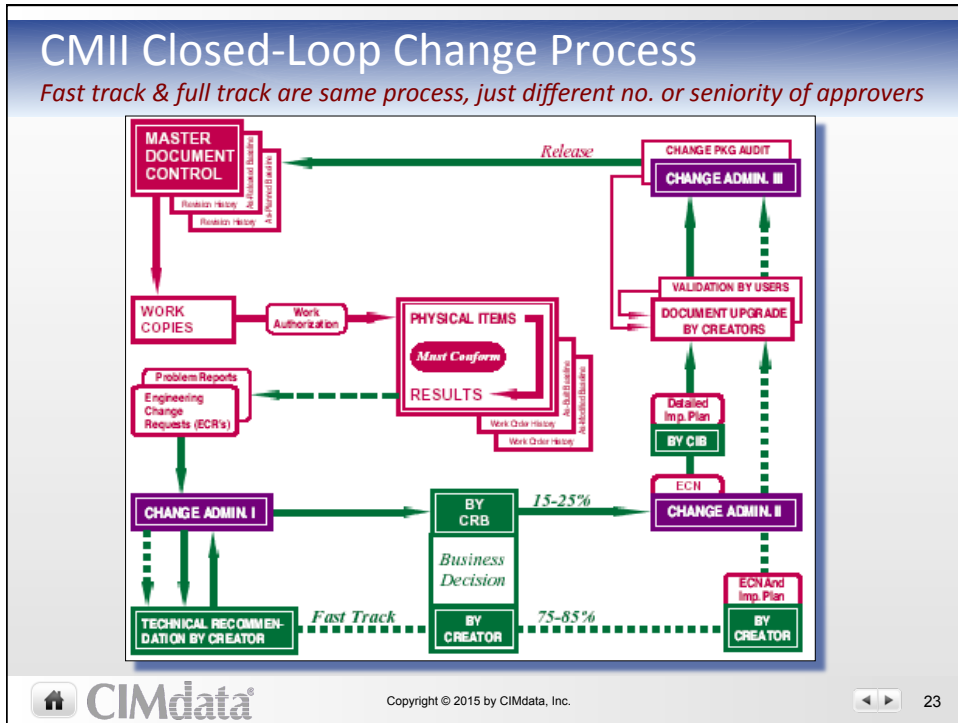
### Simplifying the Change Process

*Applying processes appropriate to change risk and complexity – ICM*



# Managing Product Changes

## CIMdata PLM Leadership Webinar



# Managing Product Changes

## CIMdata PLM Leadership Webinar

### Agenda

- What are Change & Configuration Management
- Key Change Process Issues
- Best Practices for Change Processes
- Using PLM to Support Best Practices



Copyright © 2015 by CIMdata, Inc.



25

### Change Management Best Practices

*What to focus on (1 of 3)*

- Change is managed proactively within the product development environment
  - Multiple changes are encouraged early in the product lifecycle where they are very inexpensive
  - Changes are managed so that the true impact of a change is always well understood (implies access to product data including cost, inventory, ...)
- Incomplete but accurate product design data is valuable to supply chain processes
  - Productive work can be done on product and process definition information that are accurate but not complete
  - Retaining (restricting access to) definition information until the design is complete reduces the enterprise's agility



Copyright © 2015 by CIMdata, Inc.



26

# Managing Product Changes

## CIMdata PLM Leadership Webinar

### Change Management Best Practices

*What to focus on (2 of 3)*

- Owners of data are identified as responsible for changes to that data
  - All product and process definition information has owners who are responsible for understanding the impact of change on the data elements they own
  - Owners must understand how their data elements are related to other product definition information
- Users or owners of the item being changed should approve, not a manager
- More than 3 or 4 approvers are typically not necessary
  - Typically, once key approvers sign off, everyone else follows along anyway
  - If people feel the need to know what is happening, use notifications



Copyright © 2015 by CIMdata, Inc.



27

### Change Management Best Practices

*What to focus on (3 of 3)*

- Product changes must be communicated throughout the enterprise and to extended enterprise participants as required
  - Proposed and approved changes are communicated at the right time, to the right people, wherever they are located
- Take a holistic approach to change management—allowing you to better understand the impact of a change in all forms
  - Implement a PLM solution that manages the bill of information at its core
  - Provide access to external information (e.g., cost) via PLM's interface
- View change management as part of a comprehensive configuration management activity
  - Supporting technologies are no good if they are not used within the proper process environment



Copyright © 2015 by CIMdata, Inc.



28

# Managing Product Changes

## CIMdata PLM Leadership Webinar

### Agenda

- What are Change & Configuration Management
- Key Change Process Issues
- Best Practices for Change Processes
- Using PLM to Support Best Practices



Copyright © 2015 by CIMdata, Inc.



29

### PLM for Change Management

*Best practices as defined by CIMdata (1 of 3)*

- PLM provides one master bill of information
  - A physical information structure with multiple logical views, such as “as-designed,” “as-planned,” “as-assembled,” “as-delivered,” “as-maintained”
- This master BOI is managed by one system and it feeds product configuration information to all other systems
  - It is the system of record
- It is the source for information critical to assessing change impact
- PLM can proactively warn of problems & delays in change processes
  - Provides metrics to gauge success



Copyright © 2015 by CIMdata, Inc.



30

# Managing Product Changes

## CIMdata PLM Leadership Webinar

### PLM for Change Management

*Best practices as defined by CIMdata (2 of 3)*

- PLM workflows control & assure process adherence
  - Can support both fast track and normal track versions of workflows
  - Streamline change processes & signoffs
- PLM provides visibility to product and process change information so that it can be managed strategically during all phases of the lifecycle, thereby reducing the total cost of change
- PLM supports visual collaboration during product change, with visualization and virtual meeting technology



Copyright © 2015 by CIMdata, Inc.



31

### PLM for Change Management

*Best practices as defined by CIMdata (3 of 3)*

- PLM Provides Traceability
  - The goal is to achieve end-item traceability on all changes without compromising the rules of interchangeability and to do so cost effectively
- PLM integrates with ERP & other systems to provide access to other data (cost, inventory...)



Copyright © 2015 by CIMdata, Inc.



32



# Managing Product Changes

## CIMdata PLM Leadership Webinar

### Concluding Remarks

*Expanding PLM presents many opportunities to improve process operations*

- Embrace & encourage change—changes help make better products
- Learn about PLM—understand how it can support change processes
- Understand your change process and business rules when implementing PLM
- Use PLM workflows to drive consistent change processes
- Track change problems & other metrics via PLM



Copyright © 2015 by CIMdata, Inc.



33

### Our Services...

*Creating, disseminating, and applying our intellectual capital*



#### Research

- Market research & analysis
- Technology research & analysis
- Reports & publications
- Market news
- Member services...



#### Education

- Executive seminars
- PLM Certificate Programs
- Technology seminars
- Int'l conferences & workshops
- Best practices training...



#### Consulting

- Strategy & vision
- Needs assessment
- Solution evaluation
- Best practices
- Quality assurance
- Program management
- Market planning...

*Delivering strategic advice and counsel through a comprehensive, integrated set of research, education, and consulting services*



Copyright © 2015 by CIMdata, Inc.



34

# Managing Product Changes

## CIMdata PLM Leadership Webinar

### Our PLM Transformation Clients...

*A sampling of CIMdata's international industrial clients (1 of 2)*

CPG/F&B/Process	Medical/Pharma	Fab & Assembly	High-Tech

Copyright © 2015 by CIMdata, Inc. 35

### Our PLM Transformation Clients...

*A sampling of CIMdata's international industrial clients (2 of 2)*

A&D	Auto	Emerging Ind.	Other

Copyright © 2015 by CIMdata, Inc. 36

# Managing Product Changes

## CIMdata PLM Leadership Webinar

### CIMdata PLM Leadership

*PLM Industry's most comprehensive non-biased education & training offering*

**CIMdata's certificate program is primarily comprised of a set of well defined, assessment-based PLM education and training classes.**

**These certificate programs are available to industrial companies who are considering and/or implementing PLM, and to PLM technology and service solution providers.**


**CIMdata<sup>®</sup>**  
**PLM Leadership**

 **CIMdata** Copyright © 2015 by CIMdata, Inc.  37

### PLM Certificate Program Outline

*5-day, 9-session outline for PLM Leadership offering*

- **Day 1:** Session 1: Introduction to PLM
- **Day 2:** Session 2: PLM Benefits & Potential Value  
Session 3: PLM Strategy & Solution Definition
- **Day 3:** Session 4: PLM Solution Evaluation & Selection  
Session 5: PLM Implementation, Monitoring & Continuous Improvement
- **Day 4:** Session 6: PLM Process Development & Testing  
Session 7: Integrating PLM within the Enterprise
- **Day 5:** Session 8: Expanding PLM Across the Value Chain  
Session 9: Configuration Management's Role in PLM

 **CIMdata** Copyright © 2015 by CIMdata, Inc.  38

# Managing Product Changes

## CIMdata PLM Leadership Webinar

### What Others Are Saying

*A sampling of feedback received from past certificate program participants*

“A must attend program for anyone that is planning to participate in PLM selection or implementation activities at their organization.”

—*Shinod Kumar, Edwards Lifesciences, USA*

“An excellent overview of all PLM and it’s fit to companies. Good insights that can avoid many troubles in implementation.”

—*Paulo C L Villaca, Embraer, Brazil*

“I wish we had done this before we started our PLM effort...”

—*Jeff Burk, Whirlpool, USA*

“Hazy about PLM? Come to CIMdata and clarify.”

—*Mrs. B. Uma Prasad, Bharat Heavy Electricals Ltd., India*



Copyright © 2015 by CIMdata, Inc.

39

### 2015 PLM Certificate Class Schedule\*

*Join us, to understand how PLM can help your organization*

- March 16-20 – Amsterdam, The Netherlands *(completed)*
- May 4-8 – Ann Arbor, MI USA *(completed)*
- September 21-25 – Boston, MA USA
- December 7-11 – Cypress, CA USA

**15% Discount for any scheduled class:**

*Sign up and pay by August 21<sup>st</sup> 2015*



- *Custom & private, on-site programs by request*

*\* Dates are subject to change*



Copyright © 2015 by CIMdata, Inc.

40

# Managing Product Changes

## CIMdata PLM Leadership Webinar



**CIMdata**  
*Strategic consulting for competitive advantage in global markets*



**World Headquarters**  
3909 Research Park Drive  
Ann Arbor, MI 48108 USA  
Tel: +1.734.668.9922  
Fax: +1.734.668.1957

**Main Office - Europe**  
Oogststraat 20  
6004 CV Weert, NL  
Tel: +31 (0) 495.533.666

**Main Office - Asia-Pacific**  
Takegahana-Nishimachi 310-31  
Matsudo, Chiba 271-0071 JAPAN  
Tel: +81.47.361.5850  
Fax: +81.47.362.0472

**www.CIMdata.com**

*Serving clients from offices in North America, Europe, and Asia-Pacific*

 **CIMdata** Copyright © 2015 by CIMdata, Inc.  41