

The Institute of Configuration Management

– February/March 2017 Newsletter

The foundational element of the 4th industrial revolution is a proper CM network leading to integrated people, processes, and products that communicate cohesively within an integrated Internet of Things.

One Version
of the Truth.
One Voice
to the Customer.



Newsletter – February/March
2017

2870 N Speer Blvd, Suite 270 | Denver, CO 80211

March 1, 2017

Configit Inc., Atlanta, GA, USA

Institute of Configuration Management, Denver, CO, USA

Today Configit and the Institute of Configuration Management (ICM) announce a partnership to solve the most complex configuration challenges facing large enterprise organizations.

ICM is the industry leader for configuration management, best known for their CMII/IPE model. ICM's CMII (CM2) is an enhanced version of CM. CMII brings all configuration management related activities under one umbrella and provides an infrastructure that can accommodate change, keep documented requirements clear, concise and valid while ensuring that configurations conform to their requirements in every case. Such an infrastructure is a prerequisite for achieving integrated process excellence (IPE).

Configit offers the most powerful product configuration technology in the industry. Leading manufacturers from around the globe rely on Configit's CPQ (configure-price-quote) and CLM (configuration lifecycle management) software to handle their most critical product lines.

Speaking about the partnership, Joseph Anderson, Vice President of Services and Marketing for ICM said, "The Institute of Configuration Management is happy to be working in partnership with Configit and feel this collaboration will provide transformational value for our customers. We believe that Configit's Virtual Tabulation™ technology and its approach toward Configuration Lifecycle Management (CLM) are necessary for a tangible Internet of Things. Configit's approach aligns with ICM's mantra that the foundation of the 4th industrial revolution is a proper CM network, with people, processes, and products fully integrated to a functional Internet of Things. ICM and Configit customers will have a means to achieve one version and source of configuration truth throughout this network."

Timothy Baynes, Executive Vice President for Marketing and Product Strategy at Configit stated, "Configit is excited to be working with the Institute of Configuration Management. ICM and Configit are both committed to solving difficult configuration problems for manufacturing companies. We share many of the same customers, and the same core values in helping our customers achieve excellence across business functions that touch the product. ICM's Configuration Management solutions are focused on achieving process excellence to ensure that products are manufactured and delivered to specification. Executing configuration management well is difficult, and for companies that manufacture complex products it's even more challenging. Configit and ICM will work together to deliver solutions that help companies significantly improve their configuration management processes, especially those companies that have configurable products."

Learn about Configit's product configuration software and its support for configuration management here: www.configit.com/icm-pr.

Configit®

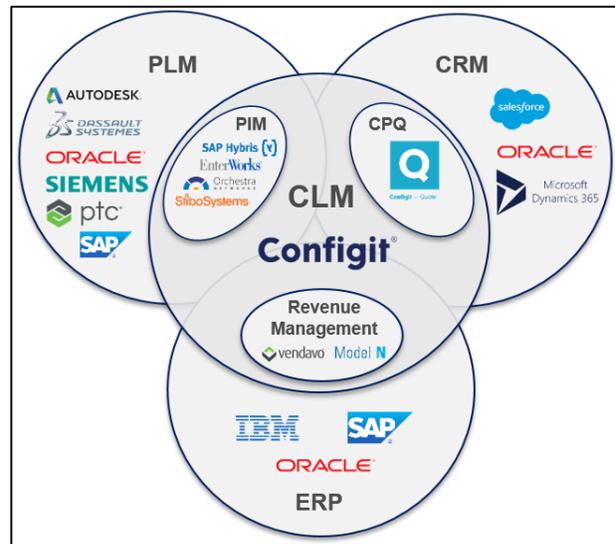
Configuration Lifecycle Management (CLM)

“Configuration Lifecycle Management is the management of all configuration definitions and configurations across all involved business processes applied throughout the lifecycle of a product.”

By implementing CLM, manufacturing companies become more agile, increase revenue growth, and reduce costs.

Configuration Disconnect

Configuration information is used across multiple business functions at various times in a product’s lifecycle. Typically, engineering develops products and features and controls the E-BOM in PLM and PDM systems; ERP systems control manufacturing, the mBOM and oftentimes pricing, while CRM-systems and market-facing systems control the sales-BOM and CPQ-processes.



All of these processes create and/or consume configuration information, but each of these deployed systems have a narrow approach to the management of configuration information. PLM systems focus on the engineering aspects of configuration, with little or no concern about how the products are priced, marketed, manufactured or delivered. Similarly, market facing systems use a model defining what can be sold, but it’s separate from the engineering model.

This enterprise disconnect, with silos of configuration definitions, results in a number of challenges:

- Misaligned data causing error states or requiring manual re-entry
- Lack of collaboration between business units, resulting in sub-optimal solutions
- Lack of insight into consequences of design decisions made by product development and/or decisions on product offerings made by sales and marketing
- Inefficient and slow change propagation across business units
- Broken sales processes with customer disappointments and margin reductions
- Configured product inaccuracies resulting in manufacturing errors
- Bottlenecks to align and transfer configuration definitions

A Single Source of Truth

Configuration Lifecycle Management (CLM) solves these problems by providing a “single source of truth” for configuration information. Configuration rules are authored and managed on a single Enterprise CLM platform supporting PLM, ERP and CRM systems. This allows all business functions to access and define configuration data – greatly improving time to market and eliminating potential error conditions.

For more information about CLM and Configit visit us here: www.configit.com/icm-newsletter



CMII: THE PATH TO INTEGRATED PROCESS EXCELLENCE

PROCESSES DESIGNED TO ACCOMMODATE
CHANGE AND KEEP REQUIREMENTS
CLEAR, CONCISE AND VALID

We teach a streamlined version of traditional CM, called CMII. The need for a good CM process is universal. As a minimum, it must be able to accommodate change and keep requirements clear, concise and valid. This essential capability is outside the scope of traditional CM. It is where CMII excels.

Our CMII training and certification program was initiated in 1986. Over 9,500 CM professionals now hold our certification. Many came from organizations using traditional CM practices. Many paradigms had to be shifted before they could fully embrace the CMII principles. The needed shifts were accomplished in every case. Students have three options for taking our courses; (1) attend courses at a public site, (2) take the courses on-line or (3) have the courses brought on-site.

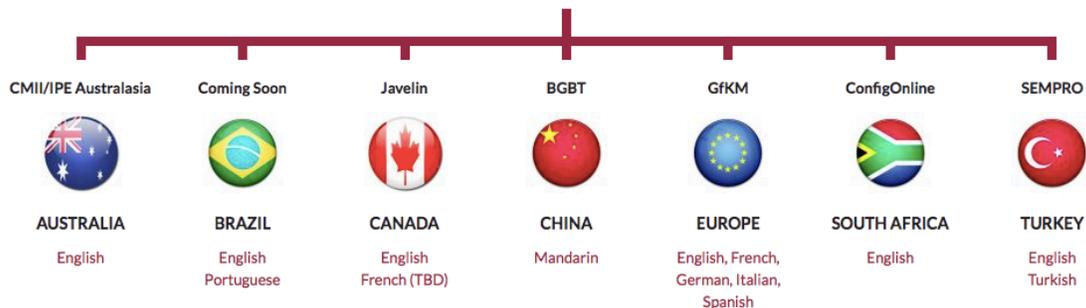
For information on course times, dates, and locations visit at [Course Schedule](#)

INSTITUTE OF CONFIGURATION MANAGEMENT



WORLDWIDE

English and Online Worldwide in English



Worldwide Training and Services

COURSES OFFERED IN 7 LANGUAGES

ICM Global Services

Assessment & Advisement

Licensed & Certified Tools

MBEE

DPDM

C2Eq

Networking

CMII Congress

Applying CMII®

Regardless of scale or complexity of your business, we have the capabilities and true industry experience to deliver the answers you need for tangible results. We will help you take action and achieve transformational change.

- Implementation roadmaps
- Assessment, advisement, and certification of your processes
- Functional work instructions
- C2Eq® and DPDM®
- WCM assess and analysis
- ...

Embedding MBEE®

The ability to configure and control the model based enterprise is critical to your future capability. MBE is a natural extension of the CMII® Enterprise Configuration Management methodology.

We are onboarding industry subject matter experts and are excited for the Model Based Enterprise Engineering (MBEE®) future.

Tangible Tools

ICM is partnering with businesses and tool (PLM, ERP, SAP) providers to ensure that the off the shelf product is truly ready for business adoption. Provider software must be licensed and certified in order to be compliant.

ICM PLM Functional Specifications

- Efficient change workflows
- Revision control
- Structure management
- Modern style sheets
- ...

C2eQ®

ICM is in the process of deploying an application that will allow organizations to quickly determine the cost roll up of proposed changes.

C2Eq® will help leadership determine whether the ROI numbers warrant moving forward with a change.

Phase two of the C2Eq implementation will include data analytics between the projected and actual costs to help organizations review the base assumptions being utilized and build better predictive cost models.

The Global Services Division is focused on providing each contracted enterprise, regardless of scale or complexity, the capabilities and true industry experience needed to deliver tangible business results. We provide the necessary assistance for achieving transformational change with phased KPI initiatives, with a focus on lean transactional improvements. Our industry experts work directly with each organization to define and create a tailored plan that utilizes a phased approach to implementing the desired business changes while adhering to the CMII® principles.

- Business Process Assessment and Transformation
- Business Summits
- Change Management – CMII®
- Configuration Management – CMII®
- Consulting
- Cost of Change Equation – C2Eq®
- Digital Process and Product Enterprise
- Enabling Software Tools
- Engineering & Industrial Services
- Enterprise Solutions, Security & Risk Management
- Executive Off Site Facilitation
- Implementation Roadmaps
- Model Based Enterprise – MBEE®
- Small and Medium Business
- World Class Manufacturing

CM's Role in Innovation

by Scott Wertel, P.E. - a Configuration Manager for a defense and aerospace company and a member of the IPE/CMII Congress.



I recently created a start-up limited liability company with a friend of mine. I've been hesitant to start a business with him because I already have my own side hustle that wasn't getting enough attention, and I really didn't want to start another ignored enterprise. But, he wore me down and in August of 2016 we created Aerospace Research and Development Group, LLC.

Other than the shameless plug, why does this matter to you? Because, unlike my first venture into entrepreneurship, I had someone else to keep me accountable for the success of the business and external motivation to keep this venture a priority in my life. Therefore, to improve our chances of success, I have been doing a lot of research. And by research, I mean reading. I

have been reading tons of trade journals, business articles, and books on entrepreneurship and innovation. Books like Good to Great and Built to Last by Jim Collins, The Innovator's Dilemma by Clayton Christensen, and most recently Innovation Abyss by Dr. Chris DeArmitt.

I classify Innovation Abyss as a comedic tragedy. It's a tragedy because in the book, Dr. DeArmitt explains failure after failure of such enlightening innovation methodologies like 6-Sigma, Open Innovation, stage-gate (or phase-gate) design processes, the Human Resources factor, and the risk averse culture that all inhibit innovation under the guise of being innovation friendly theories. Anyone who is in product development will arguably laugh at how sad a state the industry is in when looking at each of these theories in the light that Dr. DeArmitt projects on them. But then I started to think about Configuration Management and Integrated Process Excellence. Is CMII/IPE innovation friendly or is it so focused on processes and documentation that it too lacks the flexibility for the creative types to truly innovate? Will CMII/IPE be yet another comic tragedy of business theories with respect to innovation?

CM's Role in Innovation

by Scott Wertel, P.E. - a Configuration Manager for a defense and aerospace company and a member of the IPE/CMII Congress.

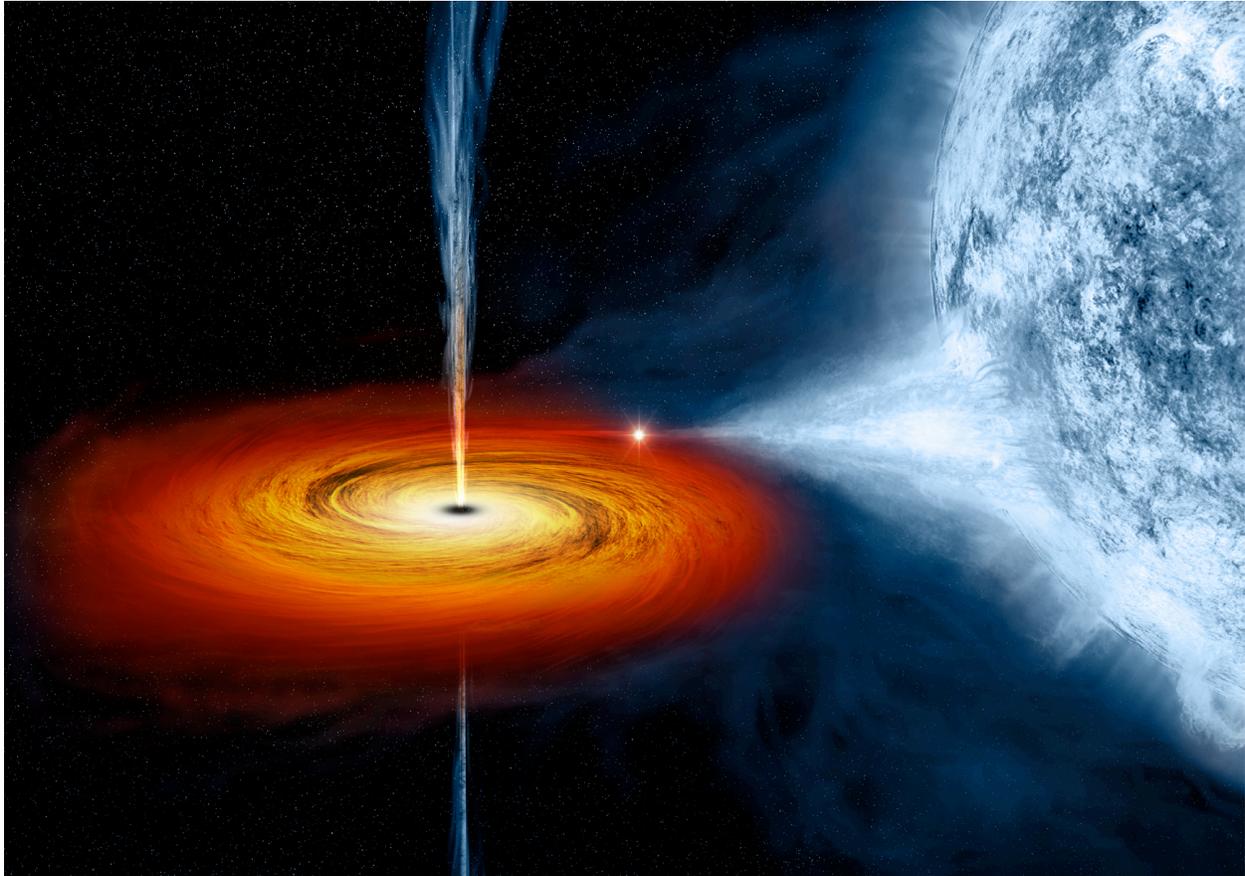


Figure 1: Watch, as good ideas continually get sucked into the blackhole of corporate bureaucracy.

What Makes a Good Process?

Before we can answer those questions, we first must decide on what makes a good process. Why does 6-sigma fail for innovation, or why does phase-gate development processes stifle innovation, or why does the business culture punish creativity? Then we can compare if CMII/IPE follows a similar trend as the other theories. We start by looking at the pros and cons of each, or another way too think is to compare the intent of the theory with actual implementation.

CM's Role in Innovation

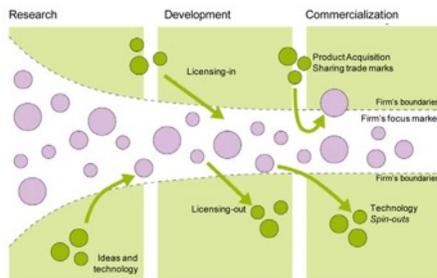
by Scott Wertel, P.E. - a Configuration Manager for a defense and aerospace company and a member of the IPE/CMII Congress.

6-Sigma



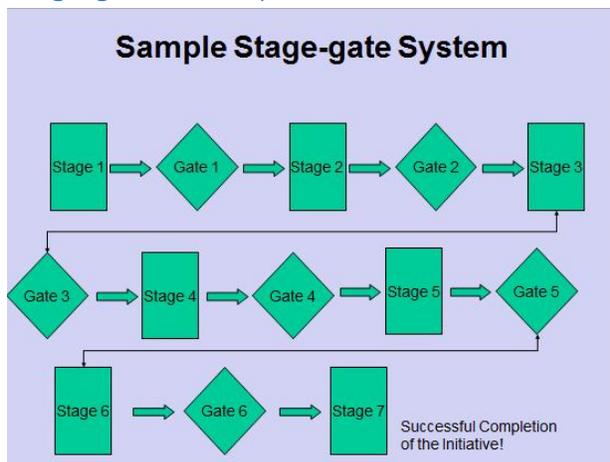
This philosophy developed by the bright minds at Motorola was intended to be used to improve existing processes. In other words, a well-defined process, typically one for mass production, can be optimized if everything about it is consistent. Consistency is the exact opposite of innovation. Innovation is the outlier from the normal distribution. By focusing on a 6-sigma, the business actually removes any hope for innovation.

Open Innovation



Open Innovation, or Crowd Sourcing, is exactly what innovation needs. It allows for many creative minds to generate a lot of creative ideas and then sort through all those ideas to find the one that could lead to success. The problem with Open Innovation, though, is that the idea generated outside the “system” cannot be easily imported into the system. It doesn't conform.

Stage-gate Development



Stage-gate, or phase-gate, development is a system that certain entrance meetings and exit meetings are held to make sure all the checkboxes in a task list have been completed prior to moving onto the next phase of development. I've heard of some systems having more than a dozen gates to pass through before a project will be suitable for market. If does not matter of your creative team invented the greatest widget in the world if they thought of that idea within the wrong phase. They must wait until the development process passes the

proper gate to do anything with it. And the only way to pass through gates is to complete each and every task on the list, regardless if it makes sense to the project.

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Human Resources and the Business Culture



Two things happen when Human Resources tries to fill the creative role when constrained by a legacy business culture. 1) They find the creative person, then confine that person to a padded cell, with a 9-5 schedule and a half hour for lunch, with an open office concept that “promotes collaboration” but is actually so noisy and interfering that a person can’t even hear their own thoughts; or 2) they create a new position with the title “Innovator” somewhere in it and expect the person who fills that role to automatically be creative. Here’s a

hint, you can’t train creativity; you’re either born with it or you’re not. Those with it can hone their abilities, or possibly lose them over time, but those without it can never obtain it. (Here’s a bonus just for reading this far, the creative people you are looking for are **NT** indication of Myers-Briggs personality types.) The creative types typically don’t like to follow procedure, and those that follow procedure typically aren’t the creative type. In order to bring innovation into a company, a company must hire a creative type, let them roam free, reward them for their good ideas, and hire someone else who enjoys conforming to process to come in after them and create order from the chaos.

Defining a Successful Creative Process

Based on the above, a successful creative process consists of the following:

- Allow wild and crazy ideas to enter the design process.
- Allow wild and crazy ideas from anywhere.
- Allow wild and crazy ideas at any time.
- Allow creative people to be creative.
- Allow process-driven people to follow well-defined processes.

Does any of this sound familiar, other than sounding vaguely like your own innovation horror stories? To me, this sounds a lot like CMII and the closed-loop change process. When the operating standards are well written and the enabling tools well implemented, the process is nearly invisible to the average user. In context to innovation, the creative type can be creative and not even realizing they are following a process. As a matter of fact, a well-defined and implemented process can remove the bureaucracy from the development process and the creative people can “just work.”

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They don't have to worry about part numbers, or naming conventions, or phase-gate reviews. As the creative person is creating, the Change Specialist is backing them up and verifying that requirements are clear, concise, valid, documented, and released. The fast-track process allows the Change Specialist to keep up with the creative type. The business is happy because ideas are generated internally, processes are being followed, intellectual property is being documented, and they are developing new ideas that can be released to market on time.

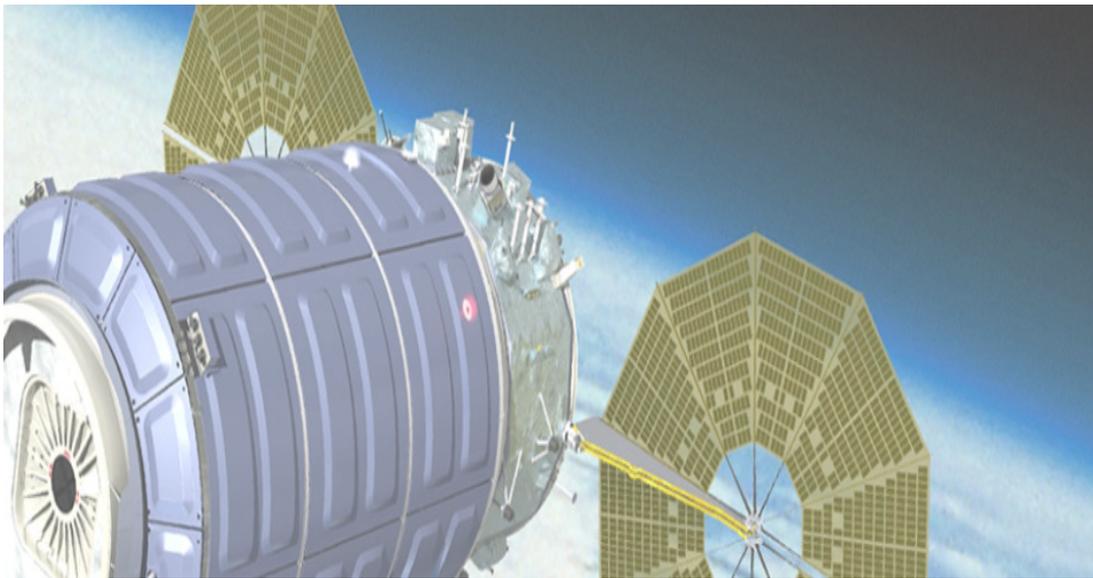
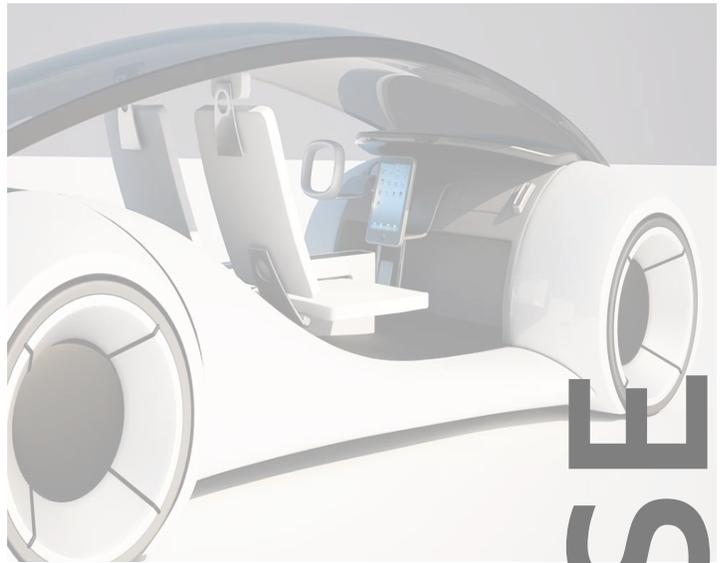
CMII and Innovation

I'm not saying the CMII and Integrated Process Excellence is the panacea of innovation. The fact that CMII/IPE is a process on its own means that it inherits some level of bureaucracy. And, since CMII/IPE is all about documented processes, of course the processes must be followed, even by creative types. What makes CMII/IPE unique, though, is that it is designed to accommodate change, and that's what innovation is. Innovation is change: a change to ideas, a deviation from the normal distribution, an anomaly that needs to be defined, a free-thinking individual that needs an unobtrusive method to capture their ideas and turn them into market reality.

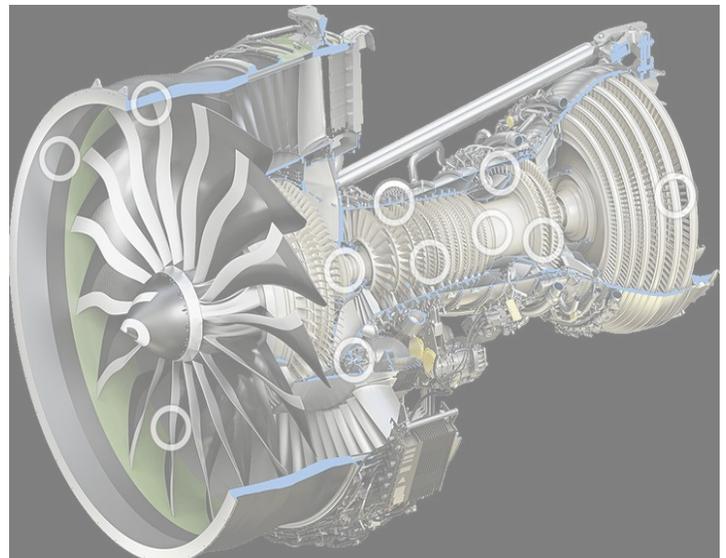
If you're interested in further dialogue regarding CMII/IPE and innovation, I'm tentatively scheduled to give a presentation and discussion at the 30th anniversary Integrated Process Excellence Symposium in Orlando, FL September 18-20, 2017. Bring your favorite references; I'm always looking to add to my reading list. And, be prepared to share some of your innovation horror stories so we can discuss how CMII/IPE may be applied to exorcise those demons.

Bio: Scott Wertel, P.E. is a Configuration Manager for a defense and aerospace company as well as a side-hustling entrepreneur and member of the IPE/CMII Congress. He enjoys using his mechanical engineering degree to be creative by designing both physical items and business processes. When not hustling with business or family, Scott is relaxing by drumming, flying, or cycling. His reading list is only getting longer.

CLEAR



VALID



CONCISE

Impact Analysis and Change Implementation Planning

Disclaimer: The views and opinions expressed in this article are mine (Martijn Dullaart, Co-Chair for the IPE/CMII Global Congress) and mine alone and do not necessarily reflect any views or opinions of my employer or any of its employees. But feel free to agree, disagree or challenge me.

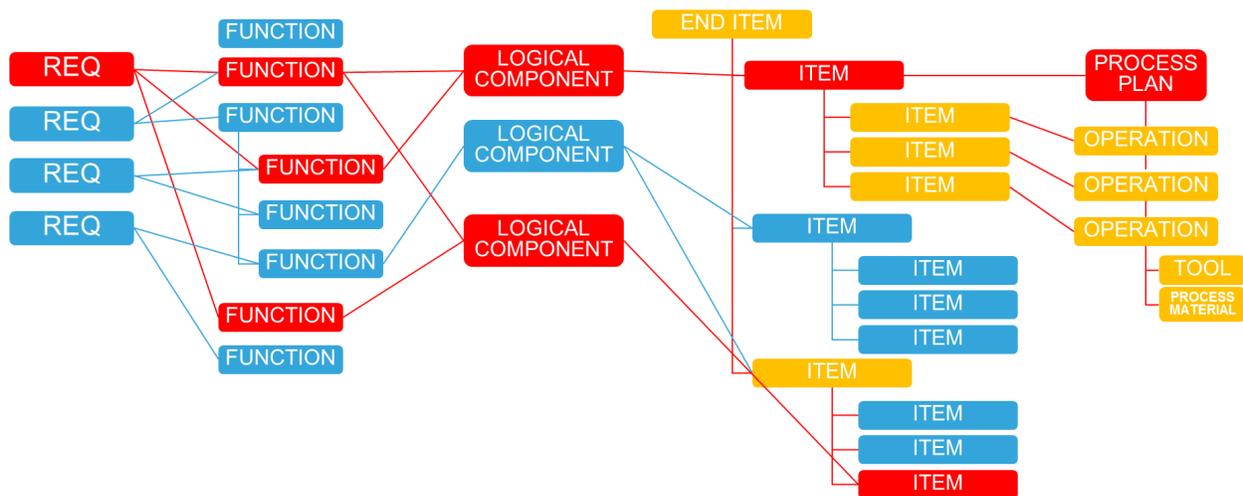
It is my belief that one of the most critical steps of the change process is the impact analysis. A good impact analysis can make the difference between profit and loss.

Most companies use the item hierarchy, product structure, or bill of material to help determine the impact of a change. However it is not as simple as that, especially with the trend of ever increasing complexity of products. Think about hardware – software dependencies that do not show up in a product structure or hardware – hardware dependencies that are not directly visible as parent – child relationships.

Increasing complexity

With ever increasing complexity of products the dependencies grow rapidly. We have requirements that define functions that in turn are translated to logical components. Those logical components are translated to items which are related to process plans. These process plans can relate to tooling, process materials and facilities. If I pull on one requirement how many dependencies in the product will I find that might be impacted by a change to that requirement?

If one changes the requirement highlighted in red in the below picture, it can impact 3 functions, 2 logical components, 2 to 7 items, a process plan, up to 3 operations and possibly a tool and a process material.



This is a simple example that does not take into account all the possible documentation that is impacted by the change. Imagine the complexity of a real product like a car, aircraft or even your smartphone. Don't forget you also need to look at other baselines such as your installed base in the field when doing an impact analysis. Facilitating the impact analysis is crucial for the success of the change process. The information of all the dependencies is typically not maintained in one tool, which means it is difficult to perform the impact analysis

successfully. There is too much information to process efficiently for the human mind without the assistance of an enabling software solution.

Facilitate Impact Analysis

Companies need to be able to facilitate their impact analysis better. That means software vendors need to provide the capabilities to do this without having to create custom code to enable a business to perform the impact analysis in a fast and user friendly way. It is not just a report; it is an interface that allows for interaction.

The solution must be able to generate a dynamic impact matrix per impacted baseline for a change request whilst taking into account all dependencies, re-identification rules and information such as stock information, items on order, and whether or not the orders can be cancelled or changed. The solution must allow the user to improve this systematic proposal and save it to initiate the automated cost calculation. These calculations are based on all the historic data to come up with a business case proposal, which can be fine-tuned before getting approval for the change request.

Change Implementation Plan

The impact matrix is just the start. Based on the impact analysis of an approved change, an implementation plan can be created. This is traditionally a lot of manual work, even though the impact matrix of the change can provide a clear implementation path. To create a solid plan more information is needed, like availability of resources, order lead times, etc.

What if it were possible to generate the implementation plan of a change and let the system help you set the best possible effectivity of each of the items on the change and let the system help in setting the correct dispositions?

What if the system could propose updates to the planned effectivity, impact to cost, or item disposition when changes happen to resource allocations, inventory, items on order or otherwise?

With the current state of technology, it is possible to build a solution that can deliver these capabilities. I have seen IoT (Internet of Things) platforms that can pull data from various systems and display it in an interactive dashboard. I have seen big data analytics platforms that can learn and model from historic data to improve decision making. These are building blocks that unfortunately still require a lot of custom coding to be made useful. Which software solution provider will deliver the first useable change impact analysis platform? This is my question and challenge to them.

Martijn Dullaart

Co-Chair of the IPE/CMII Global Congress

<https://nl.linkedin.com/in/martijn-dullaart-6641925>



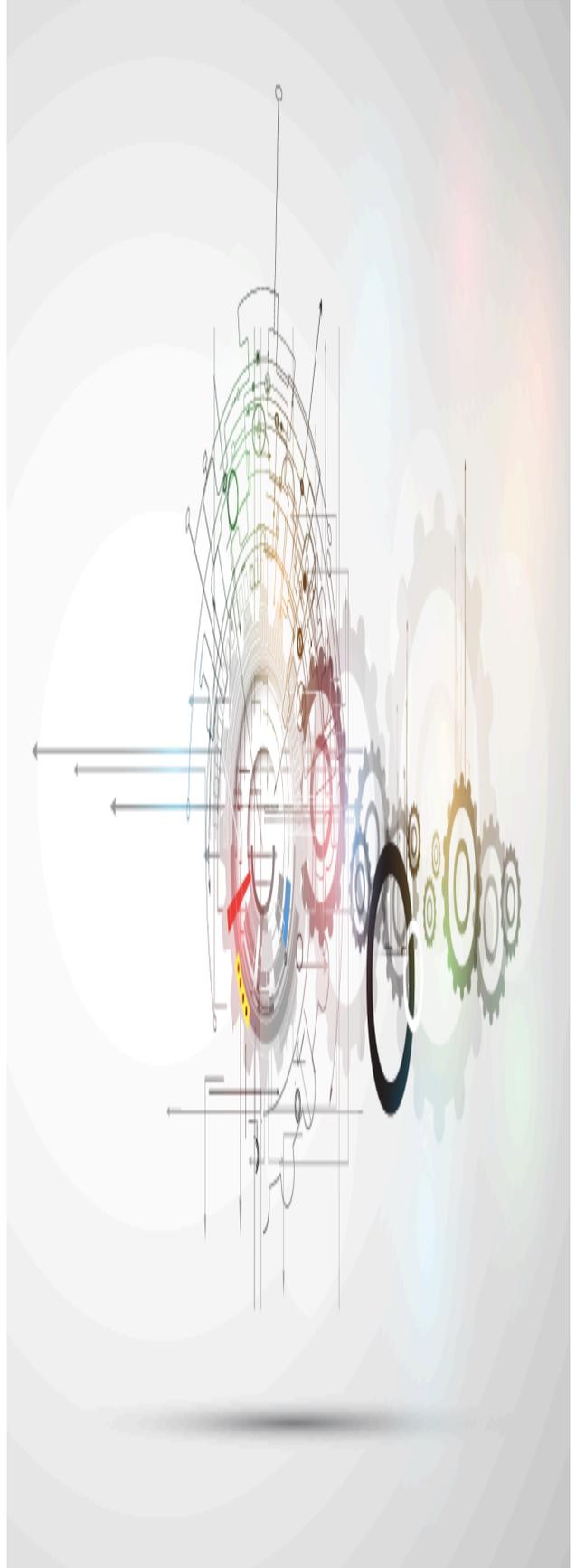
MBEE® - Model Based Enterprise Engineering

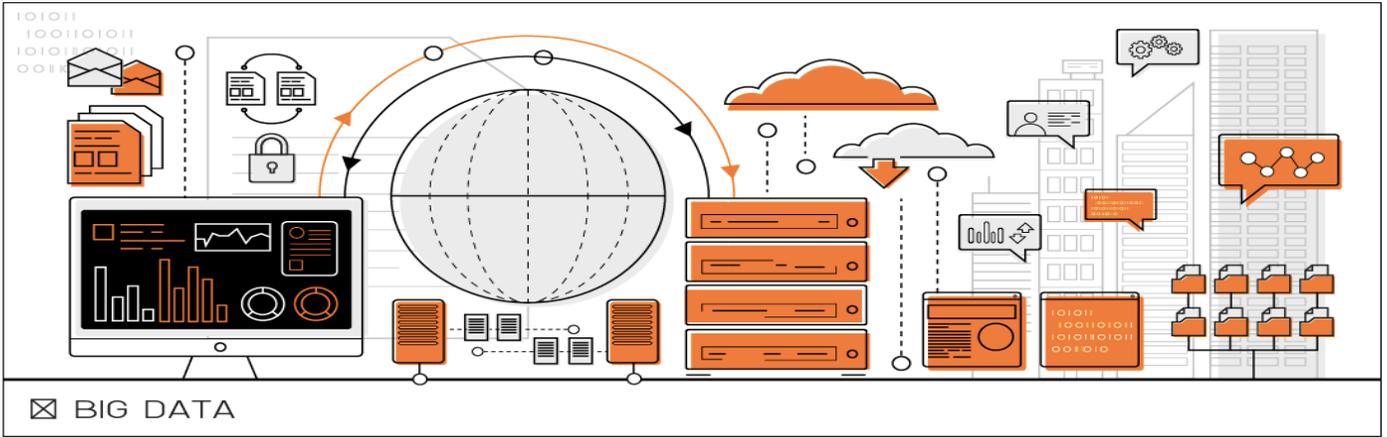
ICM is deploying a MBEE® certification path both from a process certification for companies & certification criteria for PLM suppliers.

1. Certification for companies that are looking at introducing a clean slate solution is a straightforward process. The key is in developing a solution that can work with customers' existing ERP systems that can also be transferred efficiently to the manufacturing organizations.
2. ICM will be working in conjunction with tool vendors, as part of their certification, process to ensure they can achieve all identified requirements necessary to support the MBEE® initiative prior to granting a 5-Star Certification rating to the tool.

MBEE® is a natural extension of the CMII® Business Model. The 3d geometry becomes another configuration-controlled item within the product structure of the end item deliverable within the PLM tool. The implementation approach for this initiative is tailorable depending on the capacity and agility of the adopting organization.

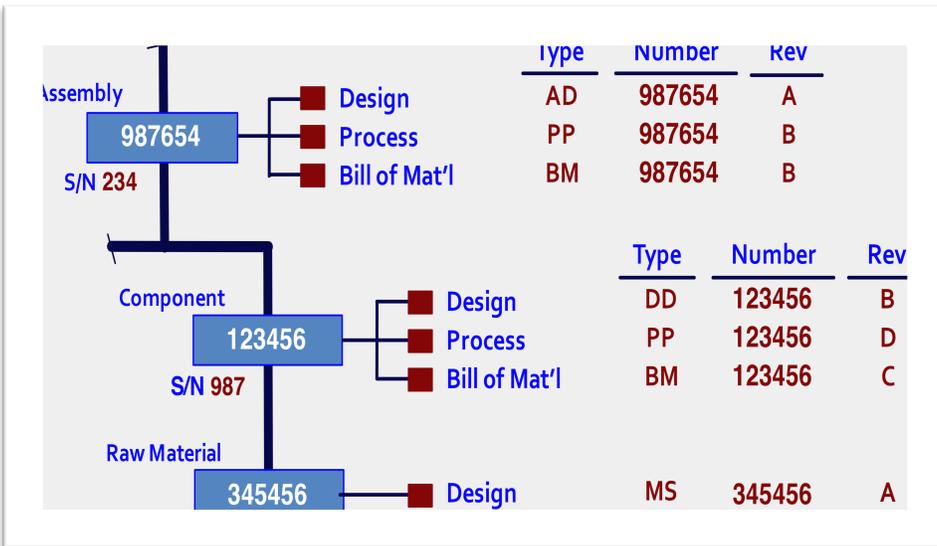
A dedicated team of industry subject matter experts will work with each organization during the journey toward the Model Based Enterprise Engineering (MBEE®) future.





DPDM® - Digital Process and Document Management

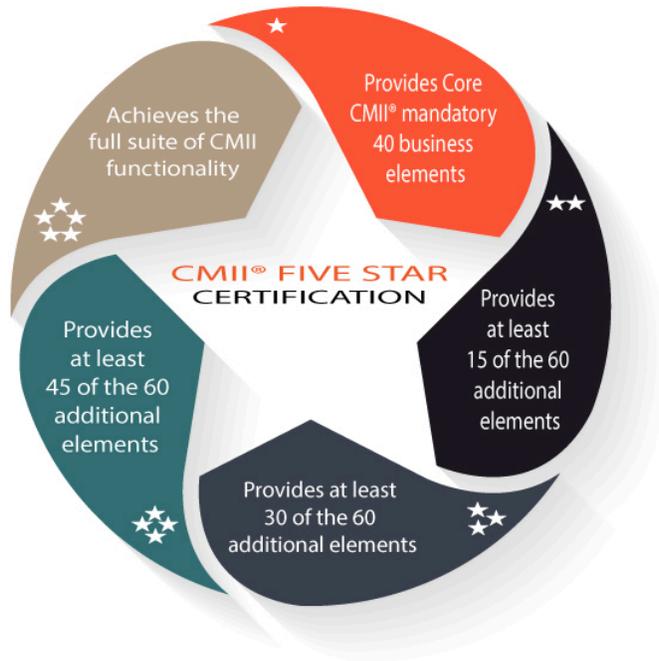
Requirement, document and content management is paramount to the success of any organization, especially when it's under the pressure of global demands and constant change. The diversity of products has quickly expanded Digital Process & Document Management to a global requirement. Rapid growth has made it difficult to keep requirements and documents up-to-date with dynamic development and market changes.



DPDM® ensures that an organization's processes and software tools can manage all requirements, documents and technical specifications in integrated product and process related environments. This ensures that the organization keeps

product and business documentation aligned with on-going changes. Successful implementation of DPDM® principles will improve issues related to schedule, cost, quality, and achieving enterprise goals.

Tool Assessment, Advisement, & Certification



ICM is partnering with businesses and enabling software tool providers to ensure that their “off the shelf” product is truly ready for enterprise adoption. Software providers must be licensed to utilize the CMII

methodology, and the software tool (by version) must be certified by ICM to be deemed as CMII compliant.

In addition, ICM has developed PLM business and design specifications for our clients to utilize that will reduce business user adoption concerns, change and development cycle times, configuration and customization costs, design defects, and overall project schedules. Our experts will work with your team to ensure a proper PLM tool that efficiently supports your users, customers, and supply chain.

Services Catalog for Business Process Requirements and Tool Support

- Efficient Closed Loop Change Process Requirements and System Capability – PR, CR, CN, WA
- Revision Control Process Requirements and System Capability
- Structure Management Hierarchy Process Requirements and System Capability
- User Interface, Interaction Process Requirements and System Capability
- Digital Process, Document Management (DPDM®) Process Requirements and System Capability
- Model Based Enterprise Engineering (MBEE®) Process Requirements and System Capability

Contact us directly for a complete list of the ICM Services Catalog

C2Eq[®] - Cost of Change Equation

ICM is in the process of deploying an application that will allow organizations to quickly determine the cost roll up of proposed changes.

C2Eq[®] will help leadership determine whether the ROI numbers warrant moving forward with a change prior to any real implementation effort being committed by the organization.

Phase two of the C2Eq implementation will include data analytics between the projected and actual costs to help organizations review the base assumptions being utilized and build better predictive cost models.



University Curriculum & Cohorts



We are excited to announce that we will be partnering with major accredited universities. It is the vision of ICM that undergrad and graduate students be able to obtain CMII[®] skills and achieve CMII[®] certification in conjunction with their respective degrees.

The ICM team looks forward to helping future leaders obtain the fundamentals necessary for achieving a culture of excellence.

Symposium Agenda Overview

The 30th Annual Integrated Process Excellence Symposium • September 18 - 20 •

Monday, September 18

7:00am - 8:00am Registration, Breakfast, and Exhibits

8:00am - 12:00n Keynote and Break-Away Sessions

12:00n - 1:00pm Lunch

1:00pm - 5:00pm Keynote and Break-Away Sessions

5:00pm - 8:00pm Reception for All Attendees

Tuesday, September 19

7:00am - 8:00am Breakfast and Exhibits

8:00am - 12:00n Keynote and Break-Away Sessions

12:00n - 1:00pm Lunch

1:00pm - 5:00pm Keynote and Break-Away Sessions

Wednesday, September 20

7:00am - 8:00am Breakfast and Exhibits

8:00am - 12:00n Keynote and Break-Away Sessions

CMII Courses on Wednesday-Friday

Introduction into CMII

Managing the Software Lifecycle with CMII

CMII Refresher



The ICM team looks forward to seeing you at our 30th Annual Integrated Process Excellence Symposium being held at the *Wyndham Grand Bonnet Creek Resort* in Orlando, FL during September 18-20, 2017.

We will have two and half days of keynote and break-away sessions. Our speakers are cross industry executives within aerospace, agriculture, automotive, building infrastructure, defense, medical, regulatory, and technology.

The sessions will be focused on best practices for tangible business transformation with a central theme of: **The foundational element of the 4th industrial revolution is a proper CM network leading to integrated people, processes, and products that communicate cohesively within a functional Internet of Things.**

Early Bird Registration ends May 31. Early bird registrants shall be entered to win a **VIP Room Upgrade** or a pair of **Bose QUITECOMFORT 35** headphones.

Our break-away sessions and extended networking breaks provide opportunities for cross-industry lessons learnt whilst ensuring maximized exposure for your products and/or your services.

For additional information contact us at services@icmhq.com.

Joseph Anderson
Vice President of Services



AEROSPACE | AGRICULTURE | AUTOMOTIVE | BUILDING INFRASTRUCTURE | DEFENSE | MEDICAL | REGULATORY | TECH

Symposium Training Courses

Introduction into CMII

This course describes the CMII approach to integrated process excellence and how to overcome the limitations of traditional configuration management. A company cannot be lean and efficient if the internal processes and requirements are not properly identified, structured, linked and owned.

This course will describe:

- what it means for an organization to operate in the corrective action mode.
- the magnitude of the intervention resources being spent on corrective action by most organizations.
- the root causes for corrective action stem from deficiencies in requirements that stem from deficiencies in the change and document validation processes.
- the process improvements needed to overcome business deficiencies.
- how to calculate the cost of CM and cost of Sales.
- a CMII based business plan and how it is used to identify the core business processes and owners.

Managing the Software Lifecycle with CMII

This course describes how the CMII model for configuration management and integrated process excellence can be applied to software. The challenge boils down to what you believe. You either expect software code to come out right-the-first-time, or you do not. The CMII model is designed to ensure that code comes out right-the-first-time.

This does not mean software development is not an iterative process. It is where the iterations take place that is most important. With CMII, the customer and the developer gain a good grasp of what the overall product is going to be at an early point in its lifecycle. With CMII, the development effort is led by a cross-functional team whose members have the full range of needed expertise. The same members serve as the change review board. Change decisions are made quickly and, if approved, implemented promptly.

CMII is a waterfall model with spiraling at each level. It excels at ensuring that software design definition is clear, concise and valid.

CMII Refresher

The basis for CMII and its underlying principles have not changed since the 6-course series leading to certification was introduced in 1986. The underlying theme is still the same; improvement in the ability to accommodate change and keep requirements clear, concise and valid. Most refinements are derived from the expanded emphasis on business process infrastructure and restructuring of the CM elements therein.

As of 2017, there are over 9,500 CMII grads. Prior to 2000, CMII grads were faced with two major challenges — weak management support and inadequate software tools. Significant progress has been made in both areas since 2000. CMII implementations have been increasingly successful accordingly. Improvements to the CMII model and improved implementation techniques have also been significant.

This course serves to bring our CMII grads up to date and reenergize their crusade to improve their CM process.

| AGCO | Airbus | Apple | ASML | Boeing | Bombardier
| Bose | Boston Scientific | Caterpillar | Cummins |
Delphi | **Over 9,500 CMII certified from over 1,800
global corporations...** | Embraer | FNSS | General
Electric | General Motors | Gulfstream | Hewlett-
Packard | Honeywell | IBM | Lear | Lockheed Martin |
Maytag | Microsoft | Motorola | NAMMO Talley |
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