

CMTrends

August 2017
ISSUE 28

News and Perspectives for CM Professionals



ANNOUNCING: CM TRENDS 2017

in
Orlando, FL Aug. 28-30

Configuration Management Seminars, Workshops, And Training

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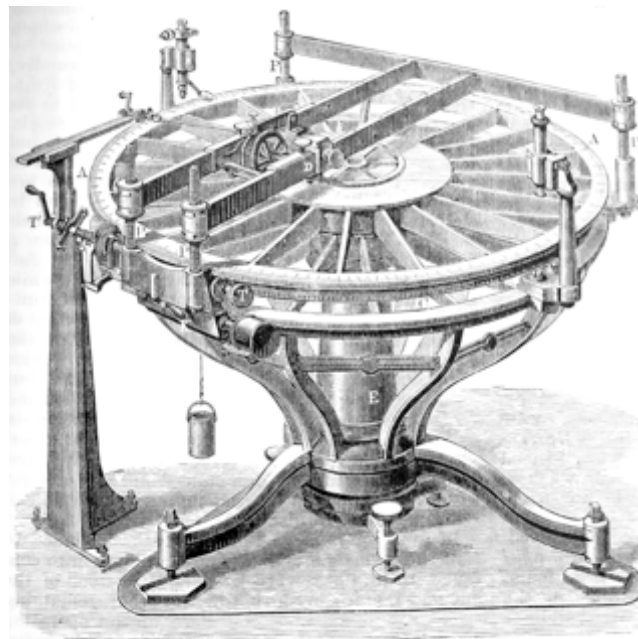
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CM Origins Part III

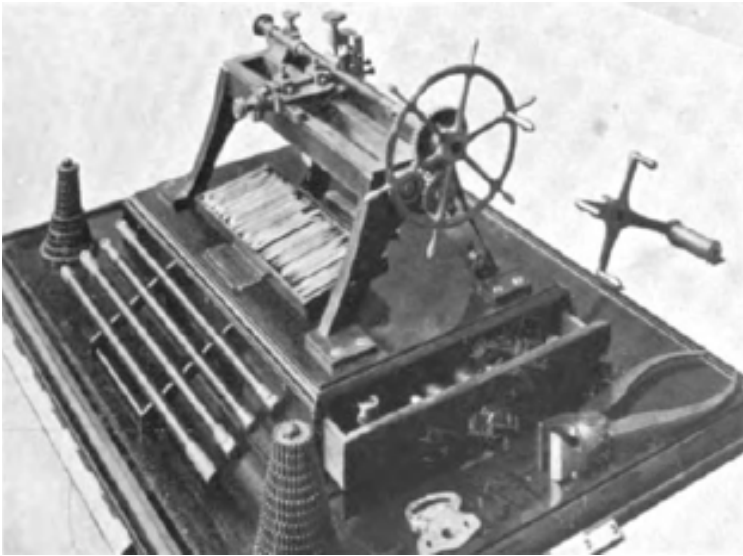
By Kim L. Robertson

The last article in this series traced evidence of mass production back to China c210 BCE where they achieved manufacturing precision of $\pm 0.5\text{cm}$ on 30,000 arrow heads. It also mentioned Jesse Ramsden's "*Description of an Engine for dividing Mathematical Instruments*". Let's look at just why Ramsden enters into this series on CM Origins. Without Ramsden the precision of everything used in modern manufacturing would not be possible. An illustration of his dividing engine is shown below.



Unknown source - Chambers Encyclopedia published 1890

Prior to his invention division marks on scientific instruments were hand inscribed using engravers tools and subject to craftsman error. After the development of the dividing engine they were controlled and inscribed by machine. This increased the production of precise scientific and mathematical instruments such as the octant and the sextant as well as manufacture of other precision devices. Henry Maudslay, considered a founding father of machine tool technology, adapted Ramsden's engine to develop the first industrially practical screw-cutting lathe in 1800.



Maudslay screw-cutting lathe c1800 - Public Domain photo

This in turn led to standardization of screw thread sizes in nut and bolts which furthered the realization of interchangeable parts across the entire design. Maudslay went on to invent the first bench micrometer c1809 known as "the Lord Chancellor", as it was used to settle any questions regarding accuracy of workmanship. It was capable of measuring to 0.00254mm. When tested in 1918 it

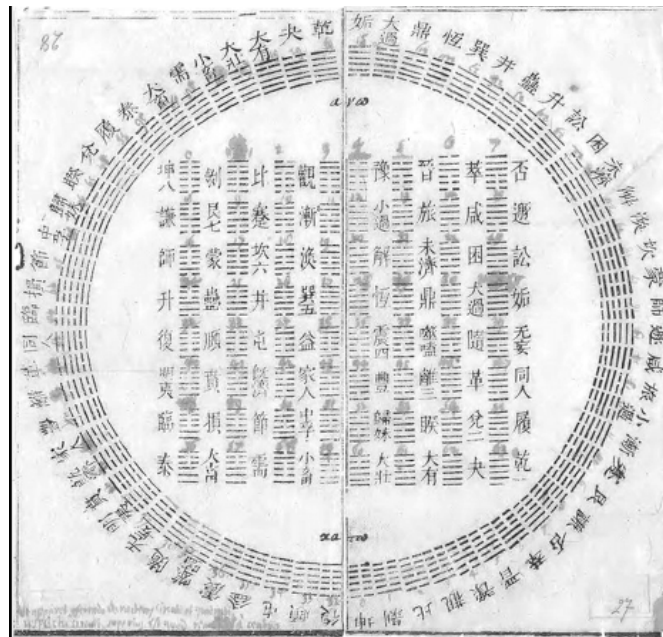
was still found to be accurate. Building on the Ramsden and Maudslay creations digital micrometers and other measuring devices are available today capable of measuring to 0.001mm with +/-0.00005mm precision.

The journey to digital manufacturing precision as found in today's Computer Aided Design (CAD) and Computer Aided Manufacture (CAM) required software and a mathematical foundation. No look at the software area of CM Origins would be complete unless it started with the mathematician Euclid of Alexandria, who, in his 350 B.C. treatise on mathematics *The Elements* expounded many of the postulates and axioms that are the foundations of the Euclidian geometry upon which today's CAD software systems are built. It took more than 2,300 years before Ivan Sutherland as part of his PhD thesis at MIT developed Sketchpad in the early 1960s. Sketchpad interacted with the computer through the use of a light pen to draw on the computer monitor. It was the first commercial CAM software system replacing PRONTO developed by Dr. Patrick J. Hanratty in 1957. Hanratty is most often referred to as "the father of CAD CAM". The key word here pertaining to why I identified Sutherland first is "Commercial".

Even these developments would not have been possible without the creation of software. When I was in Engineering in the early 1970's we were taught that all started with Charles Babbage's Analytical Engine which led to assembly language programs which led to John Mauchly's Short Code in 1949. This was followed by Regional Assembly Language, Autocode, IPL, FLOW-MATIC, FORTRAN, COMTRAN, LISP, ALGOL 58, FACT, COBOL and so forth. Well sort of ... none of those would have been possible without the use of binary machine code with its ones and zeros that makes it all possible.

Binary code assigns a pattern of binary digits (bits) to each character, instruction, and such. For example, a binary string of eight bits can represent any of 256 possible items. To discover its origins and that of Software we must return to a Chinese text called *I Ching* or *Book of Changes*. It is the oldest of all the classical divination systems. It is also one of the oldest books in the world. Its first interpretive text was composed around 1000 BCE. The *I Ching* book consists of 64 hexagrams; a figure stacked horizontal lines each line is either Yang solid line), or Yin line with a gap in the

This formed the theory defined in *l'Arithmétique Binaire* by George Boole expanded *Mathematical Analysis of* an algebraic system of Boolean algebra. Boole's a yes-no, on-off approach most basic operations:



Gottfried Leibniz I Ching Hexagrams – Public Domain

composed of six (爻 yáo), where (an unbroken, or (broken, an open center).

foundation behind the *Explication de* Gottfried Leibniz in 1679. on this and published *The Logic* in 1847 describing logic, now known as system is based on binary, that consisted of the three AND, OR, and NOT.

Claude Shannon incorporated Boolean algebra in his 1916 Master's thesis *A Symbolic Analysis of Relay and Switching Circuits* the starting point for the use of binary code in electric circuits and electronic computers. With software came the need to assure that software builds were controlled. The first development I prefer to cite is a thesis on *Software Change and Configuration Control* produced the late 1960s by Professor Leon Pressor at the University of California, Santa Barbara. The next document in my personal SW Configuration Management high five is the *Department of Defense Joint Service/ Agency Regulation, Configuration Management*. After many twists and turns this leads to the *Proceedings of the 12th Annual Configuration and Data Management Workshop*, sponsored by the G-33 Committee on Data and Configuration Management of the Electronic Industries Alliance (EIA) in 1978 and eventually to the G-33 Committee publication of EIA-649, National Consensus Standard for Configuration Management.



Kim Robertson is a NDIA Certified CM practitioner, consultant and trainer with over 30 years of experience in contracts, subcontracts, finance, systems engineering and configuration management. He has an advanced degree in operational management with a government contracts specialty and is the co-author of *Configuration Management: Theory Practice and Application*. He can be reached at kim.Robertson@ValueTransform.com

CMTRENDS

SEMINARS, WORKSHOPS,
AND TRAINING



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SPECTRUM OF CM!**

CMTrends

Orlando, Florida
28-30 August 2017

2017 S.W.A.T.

Seminars, Workshops, And Training

You are invited to learn about the latest configuration management process improvement techniques at CM Trends 2017: Seminars, Workshops, and Training! This event is intended to put you in touch with a dedicated group of professionals working to improve their CM Processes. 30-minute lectures and 1-hour long workshops will teach you new skills, perspectives, techniques, and about the direction CM is headed. You will also have ample time to speak with PLM / CM tool exhibitors, participate in Q&A sessions with the speakers, and network with your peers.



Learn more about CM Trends 2017 at: www.CMPIC.com/configuration-management-seminar
Register now: www.CMPIC.com/registration, 1-434-525-8648, or info@CMPIC.com

Discounted Post-Event Classes

August 30 - September 1, 2017 in Orlando, Florida

Every year CMPIC hosts discounted CM certification and training courses to celebrate a successful CM Trends event. These courses (typically \$1295) will be offered at \$995 to the public or only \$800 in addition to your CM Trends 2017 registration. Register now to learn more about one of the following:

Course 6, "SAE EIA-649B Principles & Applications" certification class

Course 7, "Configuration Management Assessor" certification class

Course 9, "CM Standards & Practices Update" refresher class

Course 15, "Security-Focused CM of Information Systems"



Learn more at: www.CMPIC.com/2017_CMtrends_Classes

Download our **Justification Letter** to attend.

CMTrends

Orlando, Florida
28-30 August 2017

2017 S.W.A.T.
Seminars, Workshops, And Training

Location: Venue & Hotel

All CM Trends 2017 Seminars, Workshops, and Training classes will be held at:

ROSEN CENTRE HOTEL
9840 International Dr.
Orlando, Florida 32819
www.RosenCentre.com



The Rosen Centre Hotel is located on the famous International Drive, a quick walk to shopping, dining, and entertainment.

* **The group discounted rate and room block expired on Friday, July 28, 2017.** Reservations made after July 28th will be on a space-available basis at the hotel's current selling rate.

<http://www.rosencentre.com/>

CHECK IN/CHECK OUT: Check in time is 3:00 p.m. and checkout time is 11:00 a.m.

SERVICES & AMENITIES: Complimentary in-room Wi-Fi & hardwired internet access, in-room safe, 8 on-site dining options, 24- hour fitness center, spa, swimming pool, on-site parking (discounted self-parking rate of \$7/day available during event dates; \$20/valet).



[Register Now!](#)

CM Terminology and Non-Conformances

*By Steve Easterbrook
President of CMPIC*

In the good old days a request to evaluate the acceptability of non-conformance was either categorized as a “deviation” or a “waiver”. These are the original definitions of both:

Deviation: “A specific written authorization, granted prior to the manufacture of an item, to depart from a particular requirement(s) of an item’s current approved configuration documentation for a specific number of units or a specified period of time.”

Waiver: “A written authorization to accept an item, which during manufacture, or after having been submitted for... inspection or acceptance, is found to depart from specified requirements, but nevertheless is considered suitable for us “as is” or after repair by an approved method.”

But then Mil-HDBK- 61A eliminated the term “waiver” all together and used the term “deviation” to encompass both “deviation” and “waiver”. I think (but am not sure) the authors felt the term “deviation” would be easier to understand then having the two terms- “deviation” and “waiver”.

Subsequent to that, SAE-EIA- 649 decided to group the “deviation” and “waiver” term into a single term called “variance”. Again, I think (but am not sure) they felt the term “variance” would be easier to understand then having two the terms- “deviation” and “waiver”.

ISO 10007 chose to use the term “concession” to encompass both. And, there are others that use the term “permits”, or “temporary changes”.

Personally, I like the original terms “deviation” and “waiver” because they truly represent two distinct circumstances. I never understood putting them under one term. And for metric purposes they represent two different things. The original “deviation” meant you made a decision to depart from requirements for a temporary quantity or period of time, because of a known issue. A “waiver” means you un-expectantly found out something was wrong after the fact... in my humble opinion... a “waiver” is worse than a “deviation”. Any thoughts? (responses can be posted on CM Trends Discussion Group on LinkedIn).

Thank You,
Steve Easterbrook

What Do CM Rules Do For You?

*By Lisa Fenwick
Vice President Product Development
TPT Technologies, Inc. dba CMstat*



In our most recent series of [CMsights Posts](#) we addressed the question of why not use PDM software for all Configuration Management applications, including those uses downstream of NPD engineering in aftermarket service, repair, maintenance, and overhaul. A question CMstat received afterwards was about the differences between design-centric PDM software and CM-focused tools in their ability to support CM rules and standards.

That's an important topic as the answer further illustrates why engineering BOM change management is most definitely not the same as intelligent lifecycle configuration management. This becomes especially obvious when comparing general purpose PDM software to industry specific CM tools for how easily CM rules can be defined, standardized, and enforced in the workflows they automate.

To learn more, start by viewing this short YouTube video on [“What Difference Does a CM-focused Product Data System Make”](#) that includes a demonstration of CM rules in action using CMstat's PDMplus CM software.

Lisa Fenwick

Ms. Fenwick has been employed by CMstat - a leading provider of COTS Configuration Management and Contract Deliverables Management software - in a number of roles for the past 21 years. With a degree in Mechanical Engineering from the University of Maryland and a background in Project Engineering, Reverse Engineering and Configuration Management, she has provided support to various departments including Sales/Marketing, Training, Customer Support, Implementation, and Consulting. In the past ten years, Ms. Fenwick has become very involved with new product development and standards compliance. She is a member of the Association of Configuration and Data Managers (ACDM), certified in Configuration Management (CMII) by the Institute of Configuration Management, holds CMPIC CM Assessor Certification and is active in the SAE committee for ANSI/SAE-649 revision.



Failure Assurance

By, Steve Easterbrook
President of CMPIC

There must be a million articles on “Quality Assurance”. So, I am thinking of writing a book on “Failure Assurance”. No organizations wants to have failures and many failures can be avoided with effective and efficient CM processes in place. Many organizations just don’t understand the role of CM in avoiding failure and assuring success. Here is a list of things, in no particular order, that are failure enablers (from my point of view):

- Never review and update your plans and procedures.
- Put “For guidance only” in your procedures.
- Don’t go out of your way to define/understand requirements.
- Don’t create, validate, release, manage or control your information.
- Ignore “Information Integrity” issues.
- Automate bad information (this way you can make bad decisions faster).
- Let documents lag... so information that is automated still needs to be printed out and redlined.
- Make it very difficult to determine what the correct revision/version of a document is.
- Put up posters that say (“Zero Defects!”) but don’t improve/follow CM processes.
- Have no metrics on how much money is being spent on corrective action or don’t allow these kinds of metrics.
- Spend more time planning your own vacation then planning for a multimillion dollar project.
- Use the phrase: “No cost change”. Note: Every change has a cost.

continue reading...



Failure Assurance

Continued

By, **Steve Easterbrook**
President of CMPIC

- When someone wants to improve processes... tell them not to “rock the boat” ... “that’s not how things get done around here.”
- Complain everything is terrible and when someone wants to make improvements tell them there is no time or money to do so.
- Embrace the “we’ll fix it later” mentality.
- Give raises and promotions to individuals who fail and then ultimately fix their own messes... not to process improvement personnel who can prevent those messes from happening in the first place.
- Empower the employees to make their own changes and decisions without any rules in place.
- Do not hold people accountable for the quality of their information.
- Let product requirements catch up later (We will complete the requirements after we determine what the product can do).
- Embrace the philosophy... “Our job is to get product out the door, the documentation can wait”.
- Do not provide metrics to management on types of changes and cost or reason.
- Have no method of communicating the status of changes to others.
- Do not follow changes through implementation.
- Never reidentify anything.
- Make sure everything is “urgent”.
- Do not keep good records.

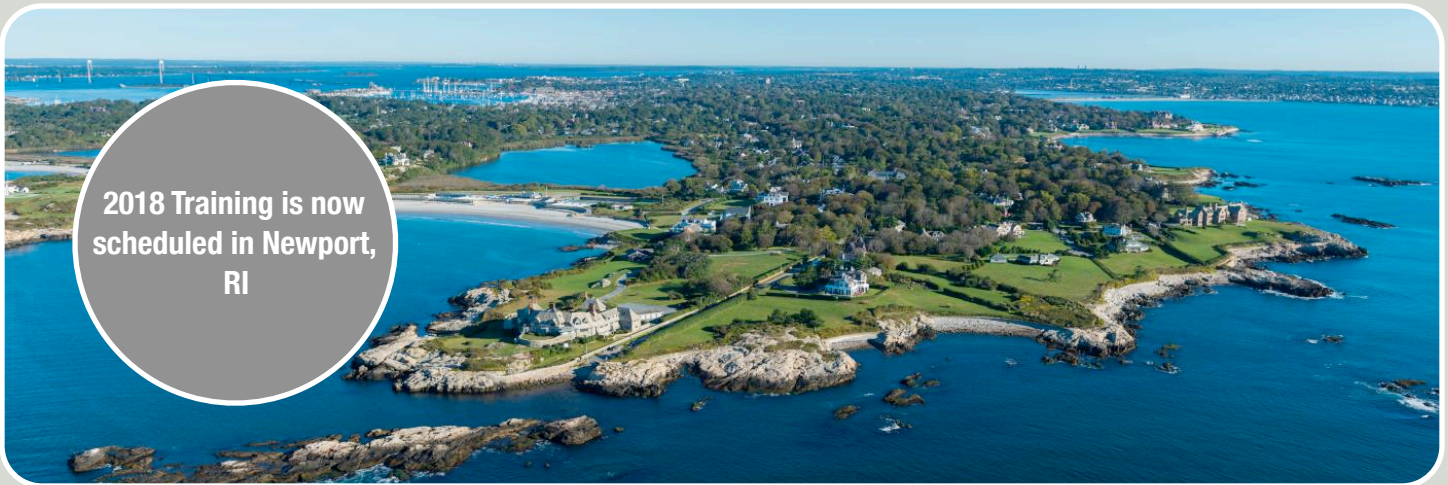


Steve Easterbrook

Steve is the President of CMPIC LLC - the Configuration Management Process Improvement Center. Steve has been working in configuration management for over 30 years. He has 12 years of experience as a Configuration Management manager in government and commercial organizations and another 18 years as a CM educator, lead assessor, and consultant. Steve has taught, lectured to, and consulted with thousands of individuals from hundreds of commercial and government organizations on the subject of CM process improvement.

NEW COURSES

NEW LOCATIONS



2018 Training is now
scheduled in Newport,
RI

CHECK OUT THE 2018 COURSE SCHEDULE

We've added new classes and new locations!

- CMPIC's new course, Course 15: "Security-Focused CM of Information Systems," will be held in Orlando, FL; North Charleston, SC; Melbourne, FL and San Diego, CA during 2017-2018.

- New class locations include Newport, RI and Melbourne, FL.

- A recently updated CMPIC course schedule is now online at <https://www.cmpic.com/configuration-management-training-schedule.htm>

- More class sessions will be added for 2018!



North Charleston, SC

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 - Washington, DC area August 14 - 17 & September 11 - 14, 2017
 - Orlando, FL October 17-20 & October 23-26, 2017 - Two Consecutive Weeks!
 - San Diego, CA December 11-14, 2017 & January 8-11, 2018
 - Melbourne, FL February 27- March 2, 2018 & March 5-8, 2018 - Two Consecutive Weeks!
- **EIA-649B Principles & Applications Certification, Course 6**
 - Orlando, FL August 30 - September 1, 2017 - CM Trends Discount!
 - North Charleston, SC January 23-25, 2018
 - Panama City, FL March 13-15, 2018
- **CM Assessor Certification, Course 7**
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 - Melbourne, FL October 11-13, 2017
 - Panama City, FL March 20-22, 2018
- **SCM: Strategies, Techniques and Tools Certification, Course 8**
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 - North Charleston, SC April 23 - 26, 2018
- **CM Standards & Practices Update, Course 9**
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 - Lexington Park, MD October 3-5, 2017
- **649-1 CM Requirements for Defense Contracts Certification, Course 10**
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 - North Charleston, SC February 13-15, 2018
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