CM Trends

News and Perspectives for CM Professionals

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Change Packages: An SCM Best Practice

by Joe Farah

Software development is complex. There are thousands, even tens of thousands, of software files. Interfaces between software components are constantly changing. Software is designed to change. In choosing a process and an SCM tool to manage your software, there are a number of best practices that are key to success.

1.   Use Change Packages
2.   Don't Overload Branching
3.   Automate CM Builds
4.   Do Peer Reviews of Source Code Changes
5.   Unit Test your Changes Prior to Check-in

Without these, you might get by, but the operative word here is "might". In this article I would like to discuss the first of these.

Use Change Packages

Change Packages, or Updates, as we'll refer to them here, are used to collect modified files for a particular change into a single package. That Update has traceability to the change request(s) and/or requirement(s) addressed by the change. It also collects information about unit testing and integration which are an integral part of the change. The Update is the engineering/programming portion of the change.

An Update is not a Change Request (CR or ECR). There can be multiple similar CRs addressed by one Update. In some cases, a CR doesn't even require a software change. As well, because of software's complexity, a single CR is often addressed by multiple Updates. It may be less risky to complete 80% of a CR than to complete 100%. In such cases, the request is logically broken up into two Updates. It is also common for a CR to be implemented by more than one developer, each developer with his/her own Update. Sometimes, it is necessary to put "hooks" into the software so that when the request is completed, the upgrade has smaller impact. Once again, using one Update for the hooks in an earlier release, and then one or more for the rest of the request, can make for smooth upgrades.

An Update is perhaps best thought of as the impact analysis parts of a request, which then are used for capturing implementation. The affected files are identified and the work is divided among developers. Impact notes are associated with each Update, and each Update is associated with the CR. If the request forces changes to requirements, a separate "Requirements Update" may be used to identify the impacted requirements, and to actually modify the requirements.

Impact Matrix = $\sum\limits_{ECR}$ Updates
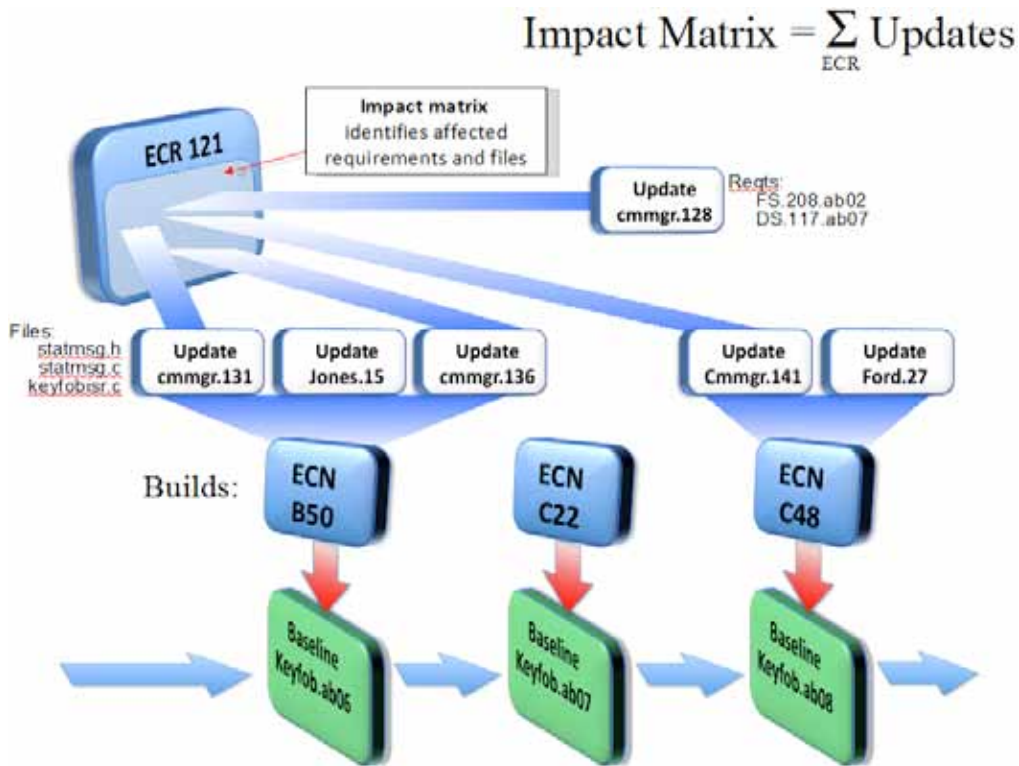
Today, a lot of SCM tools are still file-based rather than change-based. This means that instead of "checking in" an Update (i.e. to the SCM repository), each individual file is checked in. As well, each individual file has to be linked to the CR. Instead of "promoting" the Update through each step of the process, each individual file is promoted at each step. Instead of doing a "Delta Report" on the Update, it has to be done on each individual file. Not only does this cause a loss of productivity, but it is a much more error prone process, affecting product quality.

More modern SCM tools are change-based, but some of these have been made so by adding on a separate database, and possibly a separate user interface, to manage the "change" concept. This is bound to cause rebellion.

From a CM Manager perspective, it's much easier to collect updates into a Build (a.k.a. SW ECN) than it is to work file-by-file. Using Updates is essential for transitioning from a file-management CM model to a change management CM model. Don't leave change packaging out of your process, and don't put it in as an add-on. It must be central to how you do CM.

For a discussion of a number of other Best Practices for SCM, I`ll refer you to the article: "CM: THE NEXT GENERATION of Top 10 Best Practices" which can be found at http://www.cmcrossroads.com/cm-the-next-generation/9737-cm-the-next-generation-of-top-10-best-practices.

Joe Farah is the President and CEO of Neuma Technology. Prior to co-founding Neuma in 1990 and directing the development of CM+, Joe was Director of Software Architecture and Technology at Mitel, and in the 1970s a Development Manager at Nortel (Bell-Northern Research) where he developed the Program Library System (PLS) still heavily in use by Nortel's largest projects. A software developer since the late 1960s, Joe holds a B.A.Sc. degree in Engineering Science from the University of Toronto.

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Configuration Management is Essential for Project Management

By Jack Wasson PMP™, CMIIC

Is Configuration Management (CM) essential for Project Management? Well it depends, if you want to succeed, save time, costs and resources then it is essential. However, if you have unlimited resources and time, then you can practice the familiar "I'll know it when I see it" philosophy of management.

Remember the age old question of "which came first, the chicken or the egg"? One could also ask which is more important, Project Management (PM) or Configuration Management (CM)?   The answer is both. The PMBOK® Practice Standard for Project Configuration Management ©2007 [PMI®] defines Configuration Management (CM) as a subcomponent of Project Management (PM) yet most project (engineers & managers) and CM personnel have an adversarial relationship at best. The project management team feels that CM hinders them and is more concerned about producing the product on schedule and within budget than controlling the approved configuration baseline. But, as any experienced PM will tell you, that Scope Creep (change) is the primary reason projects fail by going over budget, failing to meet deadlines and failing to meet customer satisfaction. So, why do a large percentage pf projects really fail? Is it technical, poor Project Management or is it uncontrolled requirements (changes in scope)? Therein lies the problem, Scope

and configuration Baseline are not the same and this lends to the confusion because Scope and Configuration Baseline cross each other. Scope defines the overall project task including schedule, resources, and funds whereas the configuration baseline is about the approved configuration baseline at a point in time (what is approved and agreed to). If the configuration baseline changes due to customer changes in requirements or due to technical issues then naturally, the whole Scope of a project will change as well. In the PM world project scope goes away when a project is complete, but in the real world, the approved configuration baseline remains afterward for the life-cycle of the product, process or system.

Both are management disciplines and should work together in accord, but more often they do not. CM personnel are part of the Project team during the evolution of the project and remain after the project is long completed, while the Project team moves on to other projects. How can CM help the Project team? It documents and communicates all project essentials to all team members on the currently approved configuration baseline as agreed to and approved at a specific point in time.   Configuration Management augments and further reinforces the communications between the Project team members essential for project success.

Without this communication, team members may do the wrong things, may cost additional resources and create schedule slips, all of which will affect quality and ultimately customer satisfaction.

How does CM fit with project management? Think of it like a glove for your hand, catching everything. Yet few, if any, project WBS's (Work Breakdown Structures) actually plan for CM as a component, schedule it or use it properly. This is pretty ironic, since the main reason most projects fail is due to scope (change in requirements) creep and not having rigid CM processes in place. Project scope management is defined as the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. The actions of an inclusive Configuration Management process leads to both quality and a useful life-cycle for the product. Products may have long life-spans after completion and changes will be made along the way for technology refreshes, to correct problems or to extend the useful life-cycle. When changes are not controlled, maintained or documented, according to the original design, it will result in a costly and timely rework, while the product or system progressively deteriorates. The sad part is that the customers are often the largest contributors to changing requirements without providing the necessary resources, time and funds to accomplish them. This lends to the need for strong configuration management processes for a clear, traceable and controlled process for changes like a Change Control Board.
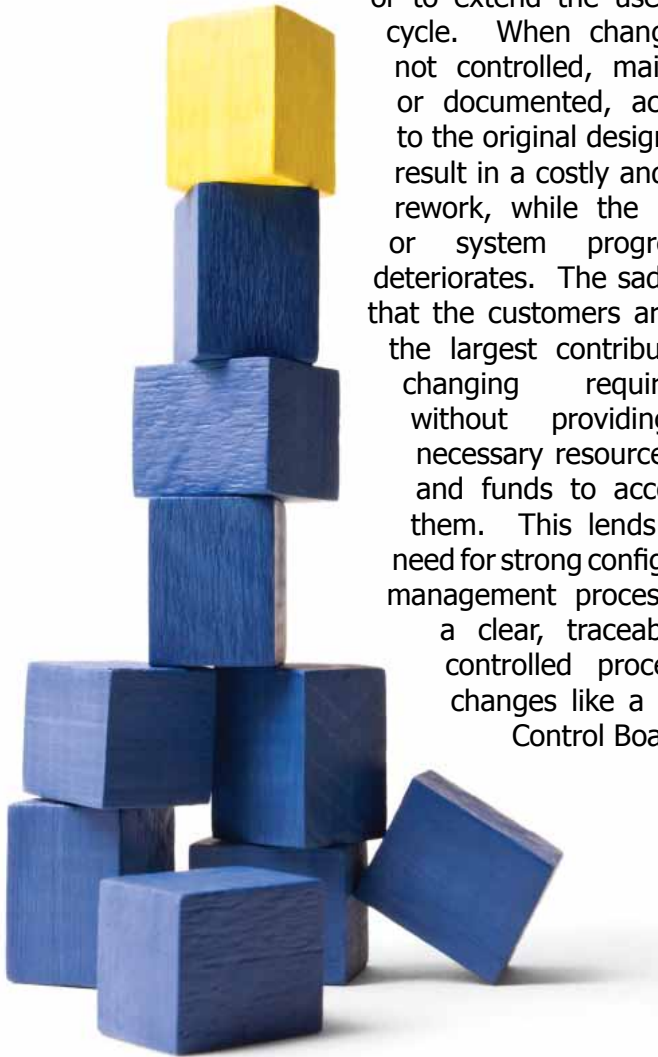
Configuration Management ensures that a project team communicates well and has the same information at any point in time, which is why it is critical for the PM to plan for it carefully. The PM must ensure that all team members are working from the same page with the exact same information at any point in time. CM is the communication tool for team members, so that everyone on the project team knows what the current approved baseline consists of. This ensures they are all building the same thing, using the same approved components and the processes are traceable and documented. The approved configuration baseline must be managed and controlled by strict configuration management processes. Many an engineer or PM has stated that CM is holding a project back, hence the adversarial relationship. But, in reality proper CM manages the approved baseline, assesses change impacts, documents status, part lists, deliverables, drawings, maintenance requirements, interfaces, lessons learned, and provides a clear traceable and accountable document trail keeping the project on track and out of trouble.

CM documents a product's configuration baseline by providing identification and traceability, functional and physical requirements as well as access to accurate information in all phases of the product's life cycle. It provides the PM and/or senior management with the ability to actually manage projects, assess risks and allow for future planning. More importantly it makes the final product or system useful to the customer or end user by providing for a means for supporting it to the end of its life cycle.

The risk of failure can be minimized by managing changes with a good CM plan and process. This is more important in today's atmosphere than at any other time in history. Currently, both government and private industry are downsizing, reducing resources with less funding to effectively manage projects. Projects are becoming increasingly more difficult and expensive to complete due to large losses of corporate knowledge as baby boomers exit the work force. This dependency on and continued loss of the baby boomer knowledge base raises issues with the validity of cost estimating, scheduling and resources. On top of all this, good configuration management practices were not adhered to in the past because there was always someone who "knew" where, what, why and how things were done in past experiences. "Corporate Knowledge" such as lessons learned, changes, methods, and processes for every new and old program, is being lost every day and is not being captured with Configuration Management.

Configuration Management has always been a prerequisite to first-class Project Management (PM) practices. It is a primary responsibility of the PM to plan CM for every project or program throughout their life-cycle by creating an effective CM plan. Configuration Managers are therefore a vital part of the Project Management Team, and their role both as Managers and agents of change, continues to increase in importance in today's technically evolving environment. As a PM (Project or Program Manager) your job is to define and plan the work to be done on a project from conception though the end of life-cycle including planning for configuration management by creating a well thought out CM plan for the entire life-cycle of a product. The CM plan specifies everything that must be documented for the final product based on the approved and dated baseline to meet the customer or stakeholder's needs. The plan should include traceable documentation for CM processes, standards, requirements, roles, responsibilities, processes, status accounting, equipment lists, parts lists, change management records, maintenance requirements, drawings, manuals, interface control documents, quality records, manufacturing processes, logistics, safety and environmental records, just to name a few, necessary for ongoing support of a product to the end of its life-cycle.

Conclusion

To preserve the usefulness of a product or system throughout its life-cycle, it must be maintained under Configuration Management (CM). Making changes must be planned for carefully from the beginning by the Project/Program Manager. Using the best people available for projects is a critical step for any project but those people may no longer be available due to downsizing, cost cutting, and attrition making Configuration Management much more essential. We no longer have the luxury of having the best people to groom (teach experience and knowledge to) and lead. Newer employees require up-to-date and accurate CM documentation to support, make changes to and maintain products or systems. In the past, there was always that someone who knew how, where or why something came about but in these troubled times many of those people are just no longer available. This makes more rigorous Configuration Management essential to save time, costs and resources plus providing a mechanism to capture corporate knowledge so we don't have to outsource or pay for doing it over and over (re-work). Configuration

Management extends past the end of the project and continues to the end of the product life-cycle. Good CM practice provides sponsors with information to clarify the business benefits, making business "buy-in" and support much easier to obtain. A PM may very well be the Configuration Manager for small projects but, for large projects they are more likely required to assign a formal CM manager. Configuration Management is still often neglected and perceived in a negative manner by engineers, Project Managers, and decision makers in practicing project management, even though the failure to manage and control changes is the major reason for most projects to fail. Configuration Management is not a bystander event, it is a team effort for all project members including management, engineers and configuration management to benefit from the project and ensuring the customer has the ability to provide for life-cycle support of the product. It is not just a matter of knowing how to perform Configuration Management it is a matter of actually requiring and performing CM properly throughout the life-cycle of any process, product or system.
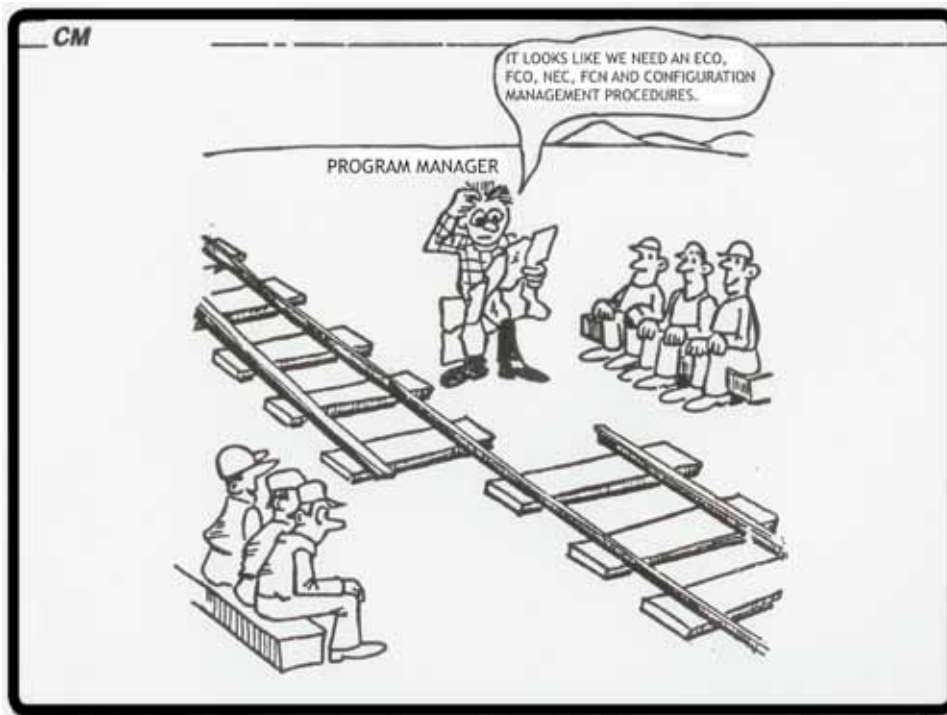
Reference

[PMI®] Practice Standard for Project Configuration Management, Project Management Institute (PMI®), 2007

Mr. Jack Wasson, CM certified and a PMP™, is a Computer Specialist with the Enterprise Configuration Management Program office in the Federal Aviation Administration in Washington DC. Mr. Wasson has over 25 years experience in Configuration Management and Project / Program Management in government and private industry.

No Train, No Gain

by Randy Omlie

Yes Martha, the light at the end of the tunnel is a train! Here are five reasons why savvy Managers are bucking the economic headwinds today and preparing to handle the recovery train with training.

1 A powerful message

Showing faith in the future of the organization and your teammates with training sends a message of preparing for the future. Smart Managers want the employees thinking positive rather than worrying about economic woes, and morale is always a critical concern. Indeed, it's widely accepted that collective training and plans foster team unity, and gets people "on the same page" as well as communicating with each other.

2 Bench strength

Today's ever-changing and tumultuous environment requires everything from multitasking to rapid execution tasking to lean process managing. Building team awareness of modern approaches while sharpening their skills and adding confidence via training pays huge dividends during business boom times, according to the prestigious "Enterprise Minnesota" advising organization. Even cross training has become a near necessity in the dynamics of today's business.

3 Plug and Play work force

Increasing efficiency and flexibility are obvious benefits to effective training, but adaptability is an overlooked benefit that's becoming increasingly important. Adapting to constant change becomes smooth as training enhances a larger focus, allowing the team players to balance changes against the larger goals and strategies.

4 Putting Time on your side

Time away from work for training is less available during boom times, and a silver lining with the economic clouds may be less time stress and easier makeup times when returning. Other bonuses include refreshed attitudes, renewed commitments, and more-efficient approaches.

5 Mutual Dedication

Training investments in your team gets everyone pulling in the same direction. When others see where you're coming from (and going toward), the natural friction that occurs among processes is eliminated. The successful companies of tomorrow are today following the old adage, "Carpe Diem" (seize the day) so their entire organization is trained to handle the economic recovery train.

Randy Omlie was a CM Practitioner and Manager for over 25 years, a long time Instructor of CM, and a Training Manger for a Fortune 500 Company. He has trained, counseled, and coached hundreds of individuals and organizations. Reach him at Randoicm2@aol.com or 952-831-1342.

Highlights
from the 2009 Conference

Congratulations!

Ken Wallace from DRS-C3 Systems is the first person awarded the CM Master's Certification in Enterprise Configuration Management. Ken (center) with Leo Clark (left) and Steve Easterbrook (right).

Embracing all aspects of Configuration Management best practices.

Four of the cm:trends 09 speakers (clockwise from upper left): Mercedes Peters, Jerry Pyka, Rebecca Rettig, Mario Vetere.

The conference attendees had opportunities to discuss issues of common concern, share ideas and experiences, and network with peers. Twenty informative presentations, six interactive discussion and Q & A sessions, five exhibitors, and eighty attendees made this event a success!

A few comments
from the 2009 Conference

"The conference was engaging and informative. All of the speakers were knowledgeable and presented solid information relating to the CM field."

"The information shared in this conference had to be invaluable to the new folks entering into the CM world. Wish this type of exposure/ information exchange was available years ago! Good to hear the different approaches to the same CM issues/challenges."

"Great topics, interesting speakers with a variety of backgrounds. I gleaned a lot of knowledge relative to tools and practices."

"The Learning Session was a great recap of the conference as a whole."

"I loved the personal touches and uniqueness of the speeches."

"Outstanding Conference!"

View or download the As-Held Conference Agenda from the CMPIC website:
http://www.cmpic.com/CMPIC-conference.htm

Linked in.

For information about future CM Trends conferences please join our group "CMPIC Configuration Management Trends" on the LinkedIn network.

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Lean and PLM Software
- Editorial -

by Leo Clark

Product Lifecycle Management (PLM) software is in every development department, automating workflow and capturing design information. These same companies are embracing lean principles to improve practices and reduce waste. But while organization's focus their lean attention to manufacturing processes, they often overlook applying those same principles to their PLM software.

Let's examine how one aspect of lean, 5S, can improve PLM software.

The Five S Principles

One aspect of lean is to apply the housekeeping principles identified in the acronym SSSSS or 5S. Originally Japanese words, the loose English equivalents are often translated as:

Select
Sort
Shine
Standardize
Sustain

Although some consultants would have you believe that 5S is a recent major breakthrough, people have known for centuries about the value of organizing tools this way.

Whether a caterer is setting the table for a dinner party, or a dentist is preparing to fill a cavity, many professionals have used these type organizational techniques long before the catchy marketing-savvy nickname came into practice.

Consider a surgeon about to perform an operation. She and her team do not just pile every single medical instrument on the floor, fish through the pile for the right one and then wipe it on their shirt before preceding.


 The instruments that will be necessary are carefully selected. The instruments are sorted in the order they will be used. Each instrument is shined, cleaned and sterilized, examined for defects and, if necessary, repaired or replaced to be fit for use. The instruments are standardized on a tray for that surgery. Then through education, training and procedures, the kit of instruments is then sustained as the correct toolset for this surgery.

This is a practice common to many trades and professions but is now being hailed as a breakthrough as part of lean pandemonium.

The PLM Problem

Take a look at an example PLM screen.
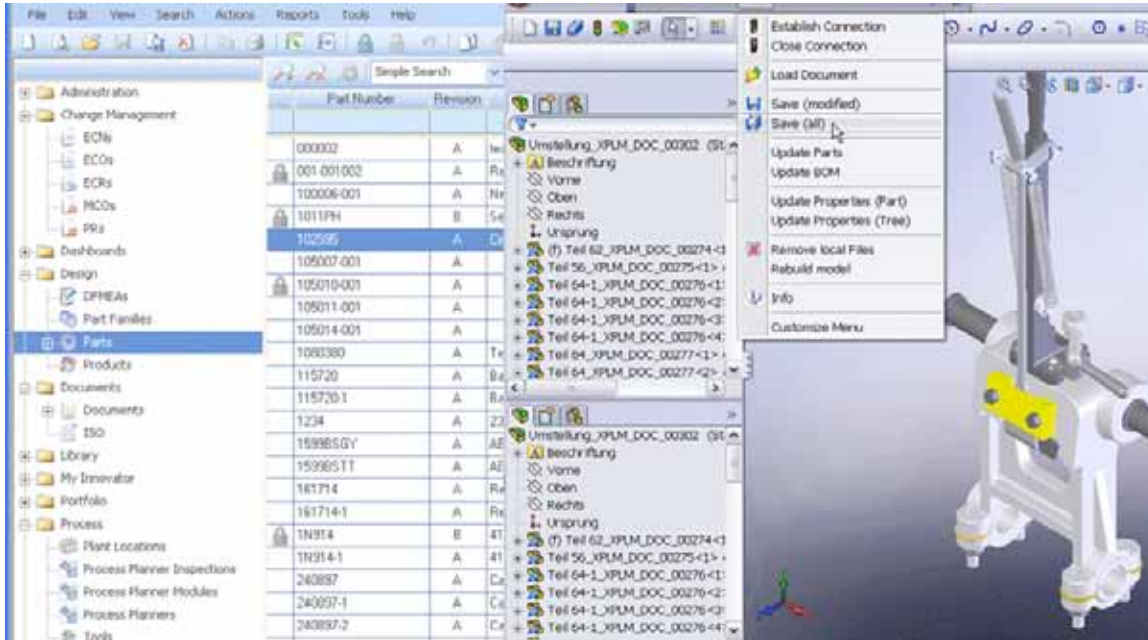
Chances are, that on your PLM software, there are 35 different fields, 8 tabs, 11 menus with commands and 2 rows of buttons across the bottom of the window. From that jumbled pile of software functionality, users are expected to click on the correct combination of controls to achieve what they want.

If you listen closely to the talk in the office, you can hear the symptoms of poor housekeeping:
"Alright, I'll show you one more time, but you have to remember how to do this."
"Yes, I know it doesn't make sense, but you'll get used to it."
"That's funny, I thought that when you press the F8 key, the report shows up."

You can also see people referring to their scribbled notes kept in a nearby desk drawer to compensate for the PLM developers/integrators lack of 5S knowledge.

5S for PLM

To achieve a task, you don't want a pile of tools and the promise of capability. You want to select the task, walk through the data entry and then select from one or two buttons to execute the commands. Unfortunately, the people who have created the PLM implementation have many excuses (under-staffed, not enough time, lack of budget, poor management support, blah, blah…) for why they chose to make using the tool cumbersome. By the way, a major objective of lean techniques is to remove burden. Most PLM users are heavily burdened.

If your organization is truly sincere about their lean efforts, they should examine the operation of the PLM software with the same rigor as is applied to the shop floor. A small investment in analysis and redesign of PLM screens reduces incorrect steps, increases throughput, improves productivity, eliminates errors and enhances user acceptance of the PLM software, thereby increasing your return on the PLM investment.

Leo Clark is CMPIC's SCM Expert. Leo has over 15 years of CM and related QA experience and ten years with the Institute of Configuration Management. He has taught configuration management to thousands of students and consulted on CM, SCM and QA implementations for over 100 companies. Leo has consulted with PDM/PLM software tool providers to improve workflows and functionality, and taught and consulted extensively on SPC, CIM, DNCMES, ERP, preventive maintenance. He is the author of numerous articles, papers and presentations on SCM, SPC and management methodologies. Leo is a graduate of Marquette University, CMPIC Certified, CMIIC, CM Lead Assessor Certification, U.S. Marine Corps, member ACDM, and ASQ.

Why Pick
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• We believe the CM standards and related guidelines are essential to every CM professional's education and we include them in our courses.

• We believe that industry approved CM standards and related guidelines should be used as the basis for establishing an organization's internal practices, and we'll tell you why these practices are important.

• We don't believe there is one CM methodology that is best. As a result we are not focused on a single approach to CM implementation.

• We provide real life examples from all environments: software, hardware, IT, facilities, etc. and we teach a variety of implementation strategies.

• Students need to learn all aspects of CM, and CMPIC courses provide them with everything they need to know to make successful decisions on how to best implement CM in their particular environments.

Linked in. To read the open public discussion on this topic please join our group "CMPIC Configuration Management Trends" on the LinkedIn network.

Upcoming CM Certification Courses

- **CMPIC Certification Series Courses 1 - 4**

  Upcoming Series:

  San Diego, CA starting November 2, 2009
  Ottawa, Ontario - Course 1 only - starts November 30, 2009
  Jacksonville, FL starting January 11, 2010
  Bloomington, MN starting January 19, 2010
  Charleston, SC (hosted by Life Cycle Institute) starting February 1, 2010
  Houston, TX starting February 22, 2010
  Seattle, WA starting March 22, 2010
  Stafford, VA starting April 6, 2010

- **Software CM Certification**

  The next CMPIC Course 5 "Configuration Management for IT and Software Development Certification" will be offered in the following location: Tampa, FL area March 15 - 18, 2010

- **EIA-649**

  The next CMPIC Course 6 "Configuration Management Industry Standard ANSI/EIA-649A Principles and Applications" will be offered in the following location: Tampa, FL area March 1 - 3, 2010

- **CM Trends 2010 Conference**

  Plans are being made now! Date and location information will be announced on our website, and on our LinkedIn discussion forum "CMPIC Configuration Management Trends."

- **Go to www.cmpic.com for more information about these courses and events.**

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