

Digitalization & Configuration Mgt.:

One Can't be Enabled without the Other

SemproConX19

19 November 2019—Ankara, TURKEY

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Strategic management consulting for competitive advantage in global markets

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Key Takeaways

Digitalization & CM: One Can't be Enabled without the Other (1 of 2)

- Digitalization is the logical next step in representing anything and everything in 1s and 0s—the next revolution
- Digitalization is moving from a fuzzy concept to the newest data-driven derailment of the *status quo*
- Digitalization is transforming products from physical goods and tangible services; in many cases data is the “product”
- The rate at which products and services are being bought and installed for the data they generate or collect is increasing
- New sources of information are speeding up innovation and product development

Key Takeaways

Digitalization & CM: One Can't be Enabled without the Other (2 of 2)

- Digitalization of business cannot happen without configuration management professionals and their enabling practices, processes, and tools
- CM is the key enabler of tomorrow's digital enterprise



“Digitalization”

Let's first get a few things straight

- **Digitalization:** the administration of *digitalis* (used to treat congestive heart failure) until the desired physiological adjustment is attained—Merriam-Webster
- **Digitalization:** the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business—Gartner

I think we should go with the second definition...

Digitization vs. Digitalization

What's the difference and does it matter?

- “Digitalization...the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business.”
- “Digitization is the process of changing from analog to digital form.”



Think “knowledge management” of the 1990’s...

Digitization Will Not Cut It

A clear need to move from files to data is emerging

- Scanning and digitizing paper documents into images is losing its value and its rationale
 - As containers for today's massive information flows, images already fall short of the enterprise's true needs
 - The mass movement from documents to data is underway



Digitalization: An Introduction

This requires us to think and action differently— isn't not about simple automation

- For many, digitalization has been a fuzzy concept
 - Digitalization is the logical next step in representing and managing anything and everything in 1s and 0s
 - An end-to-end approach to data and process management
- At the extreme techno-boundaries, digitalization is transforming products from physical goods and tangible services to data
- In today's world of nearly total digitalization, products and services are often bought and installed for the data they generate or collect—in some areas this has gone on for years

We are witnessing the emergence of digital enterprises...

A Simple Example...

The digitalization of music media and business models

- From analog to digital to enabling a new digital business model



The Emergence of the Digital Platform

The platformization of PLM—enabling end-to-end connectivity & optimization

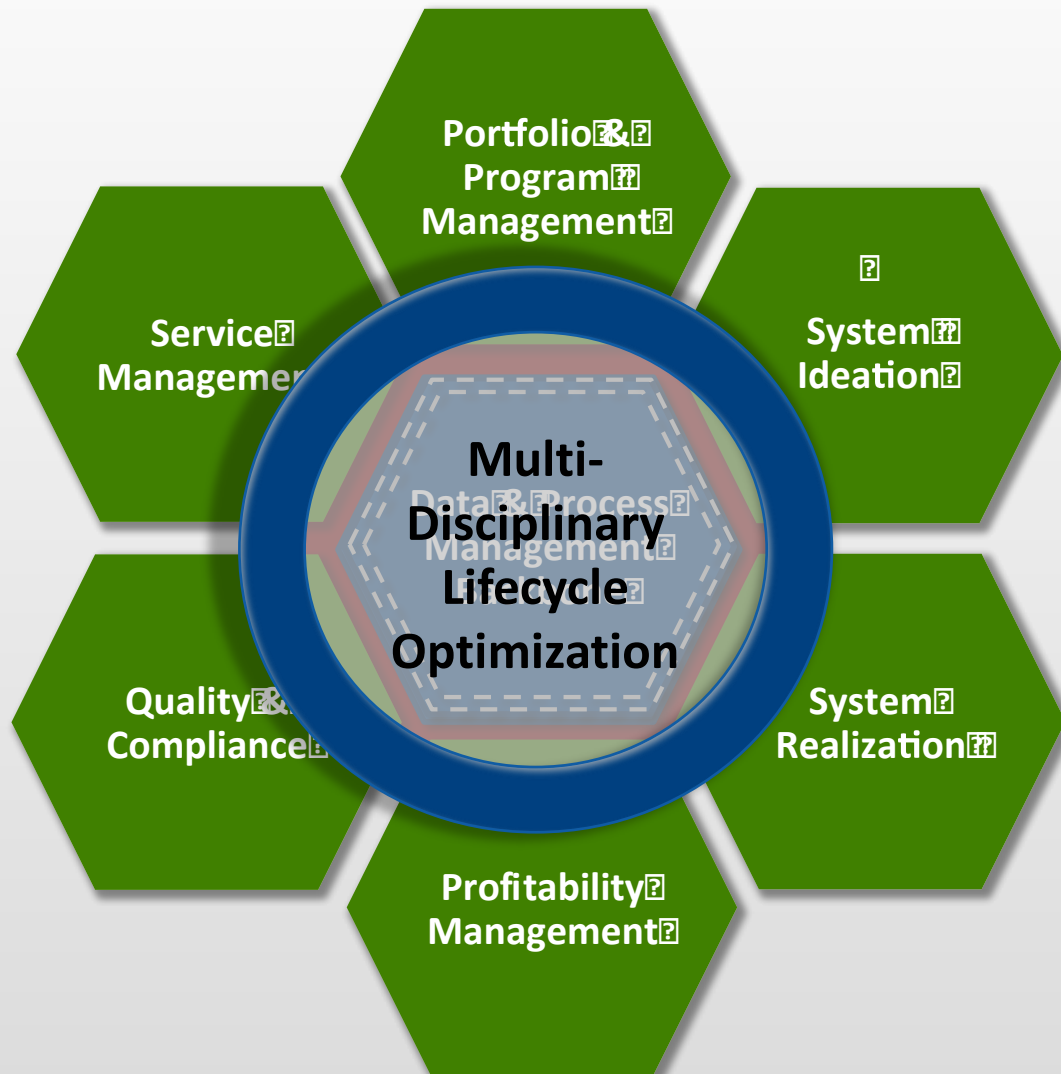
*Proliferating digital platforms will be
at the heart of tomorrow's economy,
and even government...*

The Economist, January 18th, 2014



The Product Innovation Platform

CIMdata's Product Innovation Platform Model



*A set of evolving
Functional Domains
orchestrated by an
enterprise level “systems
of systems” approach*



End-to-End Information Connectivity

Digitalization demands end-to-end information connectivity

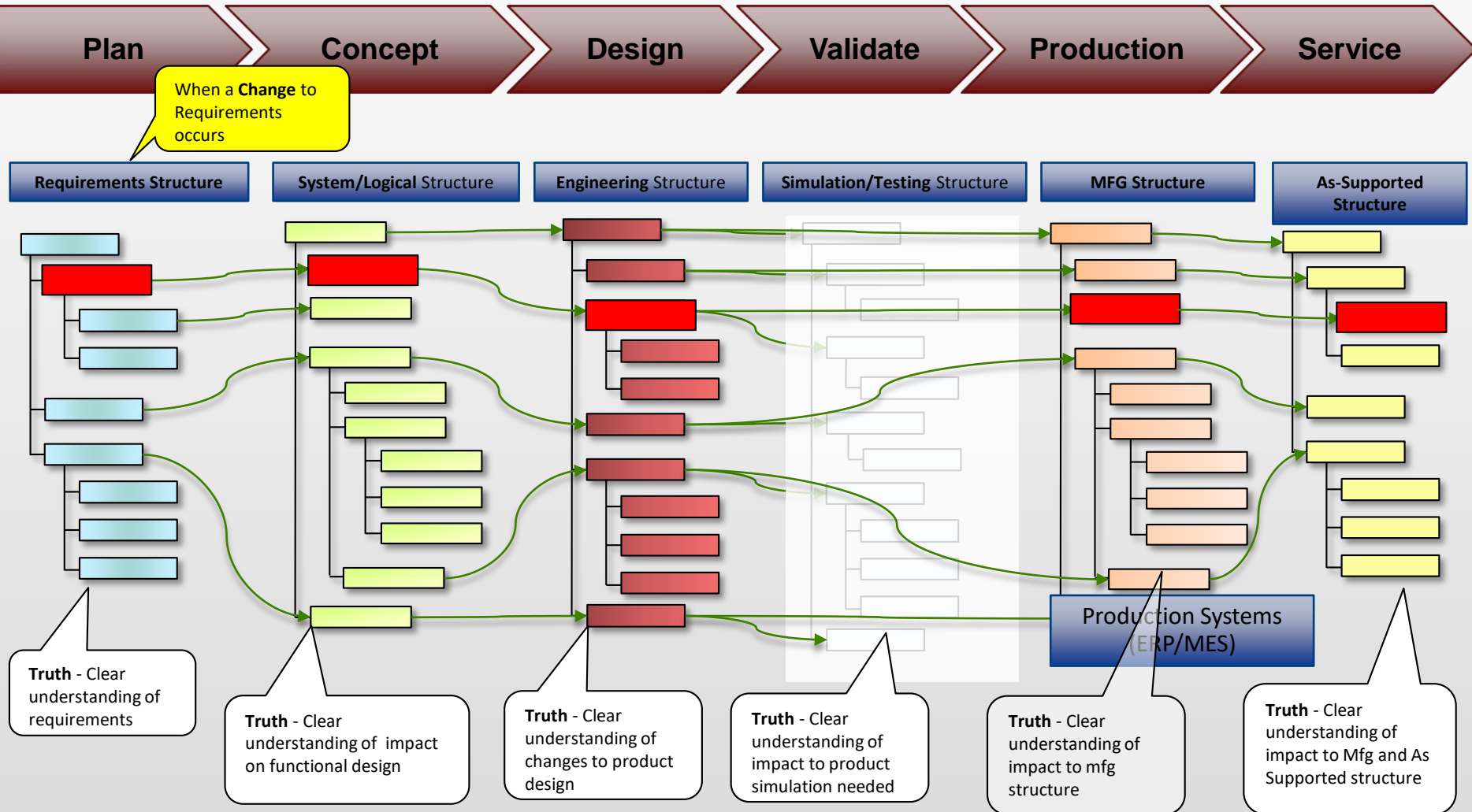


PLM Solutions—Information Management across Media, Process, Time, Geography, & Enterprise



End-to-End Connected Product Information

A single source for multiple structures (e.g., multiple BOMs)—enabling the Digital Thread



Closing the Loops Throughout the Lifecycle

Something that IoT can support in a significant way (1 of 2)

- Companies gather incredible amounts of data about every stage of a product's lifecycle and then ignore most of it
 - Some of this data comes directly from the product itself
 - Other data arrives via social media and multiple loosely structured formats
- To be useful the data needs to be understood in the appropriate context(s), format(s), ...
 - Just having the data available doesn't mean that it is useful and actionable
 - Data analytics is important, but only part of the solution, the ability to predict future issues, requirements, etc. is also required
- Steady progress has been made over many years in data interoperability, the transparency of workflows & processes, & collaboration among ever more diverse groups
 - But it hasn't proven to be enough to close all the lifecycle loops

Closing the Loops Throughout the Lifecycle

Something that IoT can support in a significant way (2 of 2)

- But remaining open loops (not to mention the new ones) often hamstring the development and support of game-changing, globally competitive products
 - These loops take the form of unanswered or unasked questions
 - These disconnects undermine collaboration among the increasingly diverse teams throughout today's extended enterprises
- Closing these loops and eliminating the workflow disconnects may be a never-ending battle
 - Due to the dynamics of product lifecycle, for every loop that's identified and closed, new disconnects appear

Digitalization: Transforming Enterprises

Digitalization requires rethinking the business, product, and data (1 of 2)

- Radical advances in digitalization are underway all around us
 - An obvious example is the intelligent, connected thermostats that mind our homes when we're away
- Digitalization itself as been defined in many ways, and but the most succinct is the business strategy best geared to extract real-world value from digital data
- The Internet of Things (IoT) with its billions of connected devices is and will play a major role
 - A source of “big data” and enabling closed loop lifecycle management
 - Making the digital thread and digital twin more achievable



Digitalization: Transforming Enterprises

One cannot escape the on coming data tsunami (2 of 2)

- Driven by the phenomenon of Big Data, information management as we know it is being re-engineered top to bottom
- Big Data threatens to overwhelm long-established workflows and processes and make them obsolete
 - This is especially true in the less computerized segments of the lifecycle such as marketing, regulatory compliance, and field service



Creating & Maintaining the Digital Twin

The digital twin cannot be achieved without configuration management

Digital

Physical Asset



<http://blogs.dnvgl.com/software/2016/04/digital-twins-structural-engineering/>

CAD Courtesy of Vol

<http://www.ansys-k>



<https://community.plm.automation.siemens.com/t5/Tecnomatix-News/Digital-Twin-Blurring-the-lines-between-reality-and-simulation/ba-p/333483>



Digitalization's Powerful Implications

Configuration management is key to digitalization (1 of 2)

- Digitalization has three powerful implications for product development and lifecycle management:
 1. A new push to ensure that all data is fully accessible in any required format
 2. The reversion of the data in today's 100's of file formats into data records
 - As today's business strategies become data centric, file formats can be stumbling blocks
 3. The arrival of Big Data in all its variety, velocity, and volume-the exabytes and yottabytes of 1s and 0s at the heart of digitalization
 - Terabyte-sized models are now routinely analyzed and optimized



The need to search and find the correct data follows...



Data Debris: Finding the Gold

Finding insights, trends, and correlations in 'Data Debris' (1 of 2)

- We must enable companies to close the information loops more tightly than ever before, with less time and effort, and fewer frustrations
 - From the top-floor to the shop-floor
 - From the design center to the field
 - From the top-floor to end of useful life
 - Etc.
- The rapidly maturing solutions and strategies are driven by two growing realizations about data shortcomings:
 1. Nearly all the digital information we collect so obsessively is useless
 2. Hidden in what some analysts call “data debris” are a myriad of insights, trends and correlations

Data Debris: Finding the Gold

Finding insights, trends, and correlations in 'Data Debris' (2 of 2)

- Knowledge and insights are built up from countless data points, which means measurement that have to be collected and managed
- Industrial companies need to understand...
 - What measurements are needed?
 - What are the best ways to retrieve & manage these measurements?
 - How can the IoT can help (i.e., smart connected products)?
 - How can measurements—data in the raw—be placed in their proper informational contexts, e.g. trends and correlations?
 - What predictive analysts can be applied in support of closing the loops more quickly and efficiently?

The implications of digitalization are widespread...



The Impact on Configuration Management

Improved tools and different workflows in configuration mgt. are required

- The amount of data that requires management is increasing exponentially...and it's not getting any easier
- Key trends impacting CM practices, processes & practitioners
 - The push for digitalization, often without understanding what it is
 - Data is rapidly becoming the product in many cases
 - Rapidly changing regulations and data security needs that must be dealt with
- The digitalization's impact on the future of CM:
 - Does your organization see and understand the connection between digitalization and CM?
 - Does your organization have the right CM systems, processes, and experts in place to support your company's digital transformation
 - Digitalization might provide the necessary tipping point for CM

Final Thoughts

PLM: The Foundation for Enterprise Digitalization (1 of 2)

- Digitalization is the next revolution
 - It is moving from a fuzzy concept to the newest data-driven derailment of the *status quo*
 - It is transforming products from physical goods and tangible services; in many cases data is the “product”
- There are major consequences in all this for...
 - Product development, lifecycle management, the management of intellectual property (IP), innovation in general...and multiple aspects of CM
- We need to figure out how to make the most out of the data
 - In many cases, data is becoming assets at least equal to the value of physical goods and tangible systems containing that information



Final Thoughts

PLM: The Foundation for Enterprise Digitalization (2 of 2)

- We need to continually rethink CM and how we enable our CM processes to support the digital transformation
 - Business models (e.g., the digital enterprise), positioning, platform strategies, solution offerings, CM processes & procedures...may all have to change
- The march of technology, digitalization included, is widely recognized as both unstoppable and incomprehensible
- Digitalization of business cannot happen without configuration management (CM) professionals and their enabling practices, processes, and tools

Digitalization requires (no, demands) CM!



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