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AFNeT Standards Days

Standards for System Life Cycle Processes

by

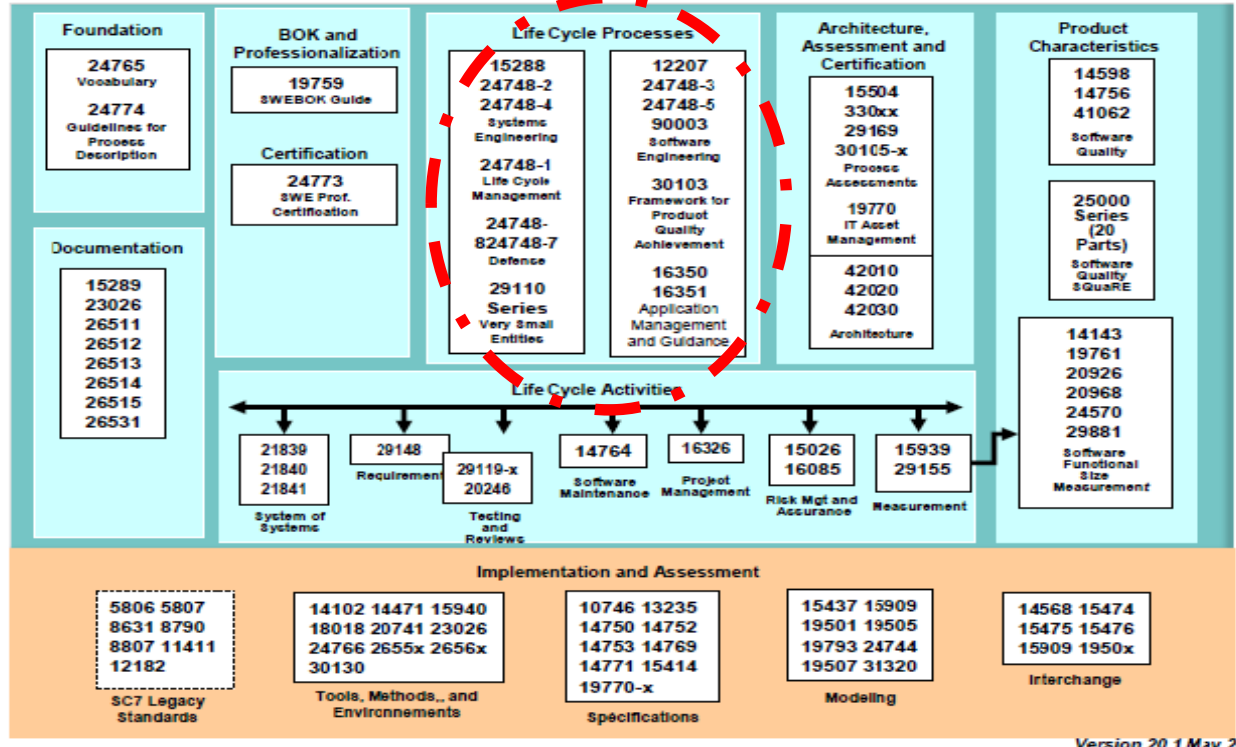
Philippe BOERI

(Chargé de mission Normalisation AFIS, President CN IQLS AFNOR, Naval Group)

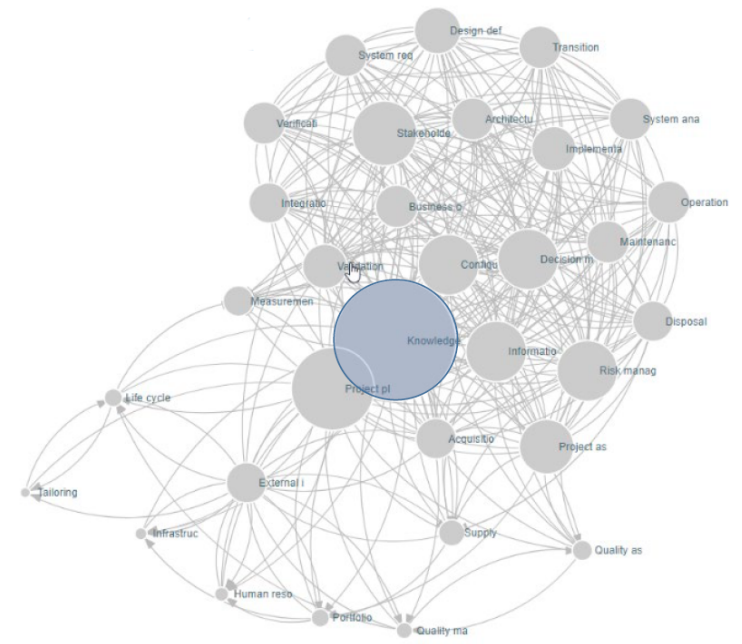
<http://standardsdays.afnet.fr> - AFNeT Standards Days 2020 : 6 & 7 October 2020

A huge collection of Standards : Focus on the ISO JTC1/SC7 Cartography

Overview of the SC 7 Standards Collection

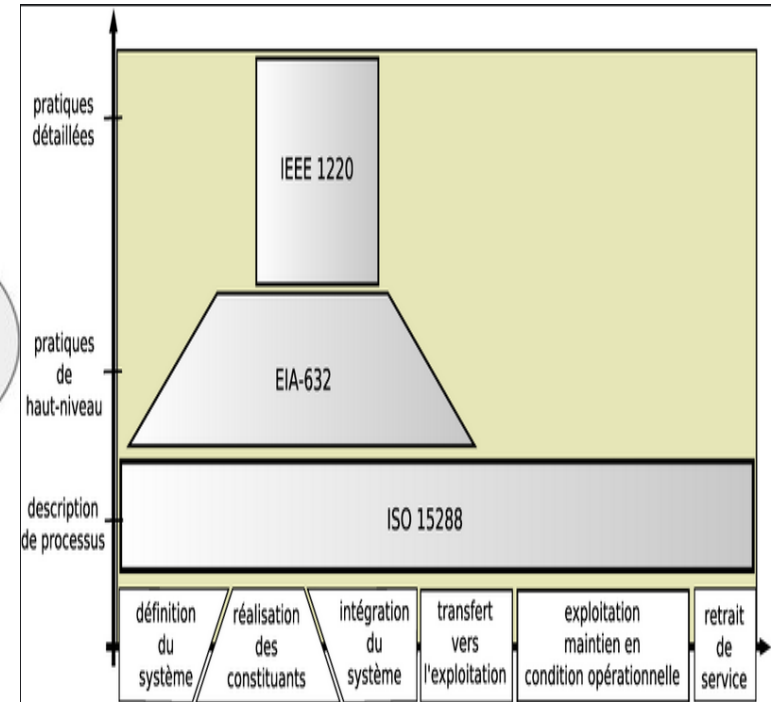
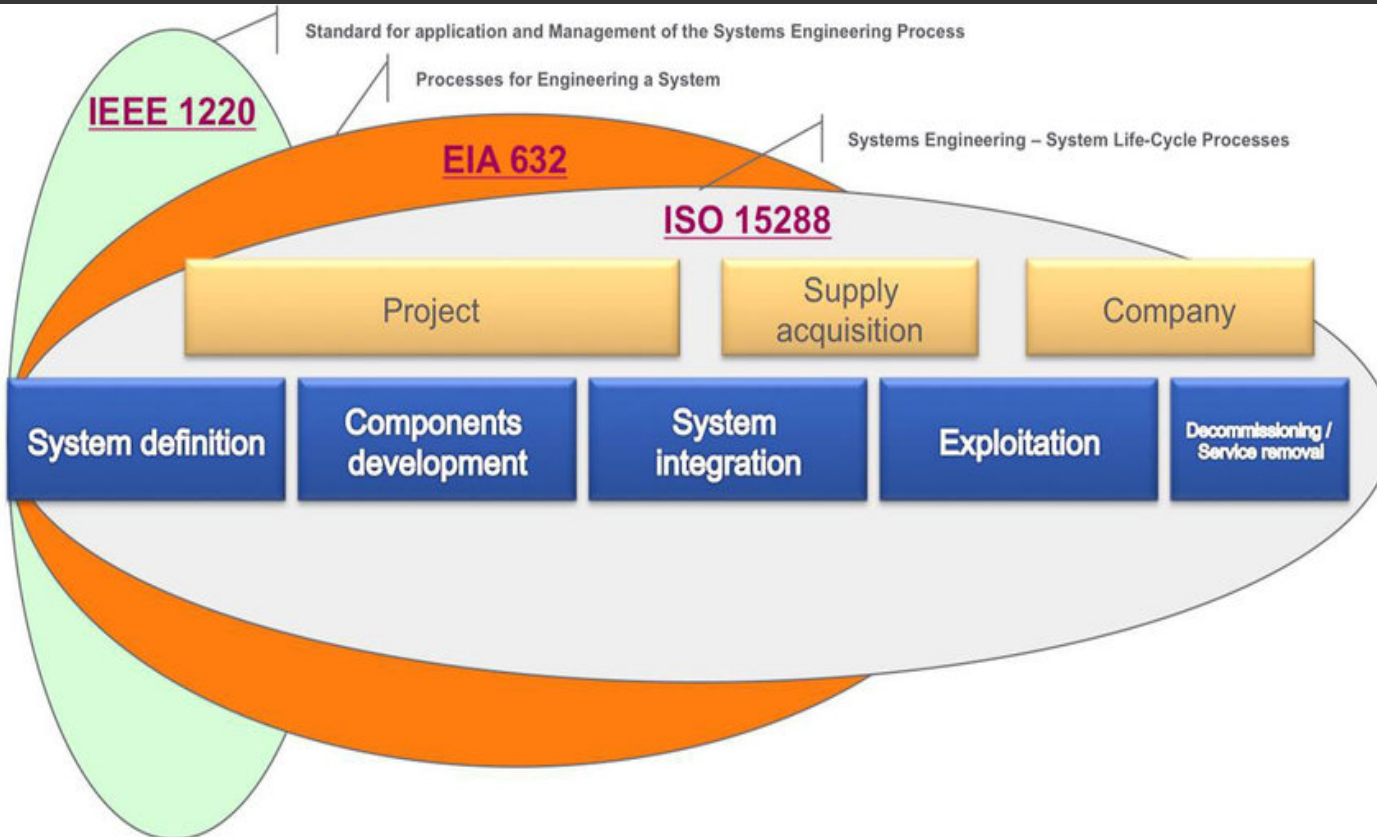


Version 20.1 May 2020



Plenty of standards interrelated into the System & Software engineering scope (ISO JTC1/SC7), covering System **Life Cycle processes and activities**, foundation, architecture, product, Product Line, system of system, assessement, documentation... in liaison with other standards developed in other Sub Committees such as SC40 for IT Service Management and governance, SC27 for Security, SC42 for Artificial Intelligence....

Major Standards for System Engineering Processes supporting the Life Cycle



(*) **IEEE 1220 (2005)** : Standard for application and Management of the Systems Engineering Process

(**) **ANSI/EIA 632 (2003)** : Processes for Engineering a System

ISO/IEC/IEEE 15288 (2015): System Engineering – System Life Cycle Processes

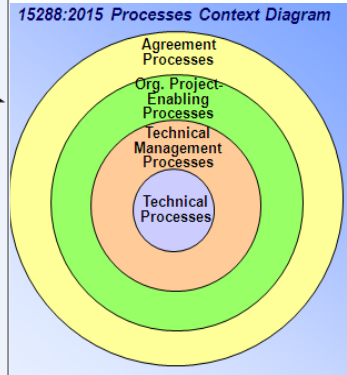
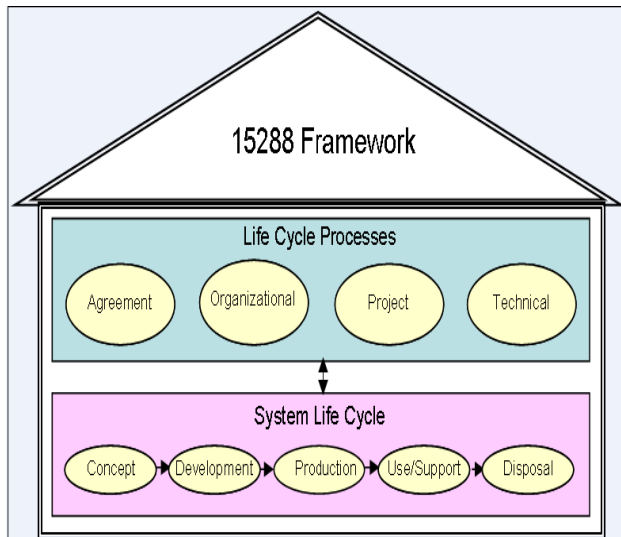
(*) recovered in ISO/IEC/IEEE 24748-4 (2017)

(**) recovered in SAE 1001 (2018)

System Life Cycle processes : Focus on ISO/IEC/IEEE-15288:2015

4 groups of processes covering the system life cycle

- ✓ **TECHNICAL** processes
- ✓ Technical **MANAGEMENT** Processes
- ✓ **ORGANISATIONAL** Project Enabling
- ✓ **AGREEMENT** Processes



System Life Cycle Processes		
Agreement Processes	Technical Management Processes	Technical Processes
Acquisition Process (Clause 6.1.1)	Project Planning Process (Clause 6.3.1)	Business or Mission Analysis Process (Clause 6.4.1)
Supply Process (Clause 6.1.2)	Project Assessment and Control Process (Clause 6.3.2)	Stakeholder Needs & Requirements Definition Process (Clause 6.4.2)
Organizational Project-Enabling Processes	Decision Management Process (Clause 6.3.3)	System Requirements Definition Process (Clause 6.4.3)
Life Cycle Model Management Process (Clause 6.2.1)	Risk Management Process (Clause 6.3.4)	Architecture Definition Process (Clause 6.4.4)
Infrastructure Management Process (Clause 6.2.2)	Configuration Management Process (Clause 6.3.5)	Design Definition Process (Clause 6.4.5)
Portfolio Management Process (Clause 6.2.3)	Information Management Process (Clause 6.3.6)	System Analysis Process (Clause 6.4.6)
Human Resource Management Process (Clause 6.2.4)	Measurement Process (Clause 6.3.7)	Implementation Process (Clause 6.4.7)
Quality Management Process (Clause 6.2.5)	Quality Assurance Process (Clause 6.3.8)	Integration Process (Clause 6.4.8)
Knowledge Management Process (Clause 6.2.6)		Verification Process (Clause 6.4.9)
		Transition Process (Clause 6.4.10)
		Validation Process (Clause 6.4.11)
		Operation Process (Clause 6.4.12)
		Maintenance Process (Clause 6.4.13)
		Disposal Process (Clause 6.4.14)

Technical Processes could not be applied efficiently without technical management, agreement and organizational processes, along the Life Cycle

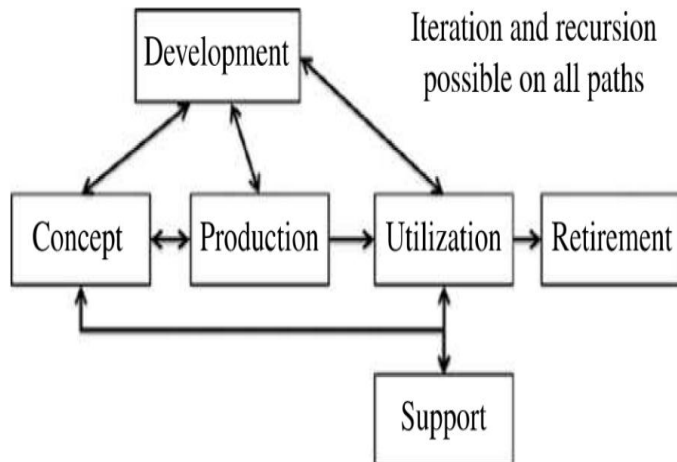
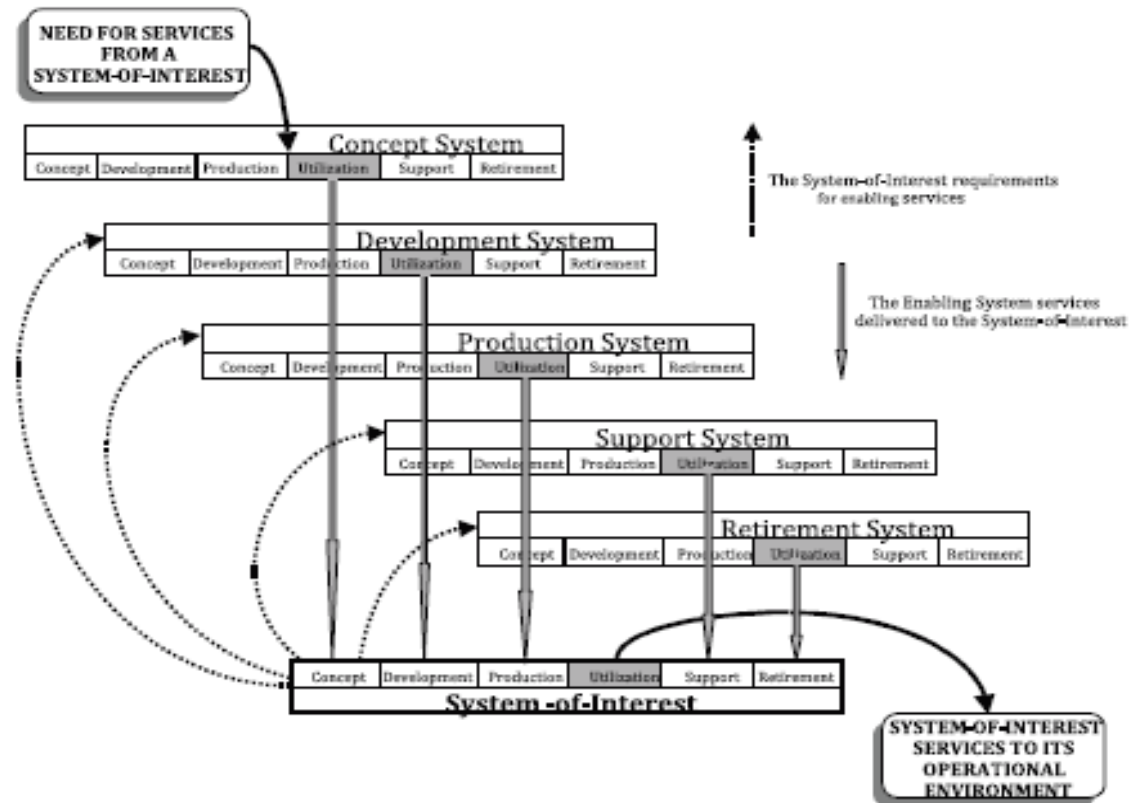


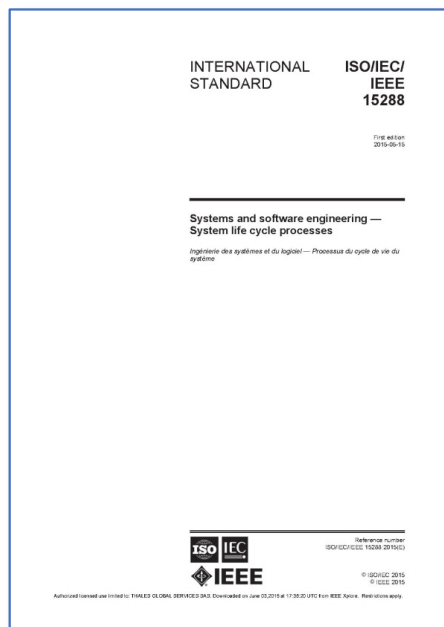
FIGURE 3.2 Life cycle model with some of the possible progressions. This figure is excerpted from ISO/IEC TR 24748-1 (2010), Figure 7 on page 13, with permission from the ANSI on behalf of the ISO. © ISO 2010. All rights reserved.



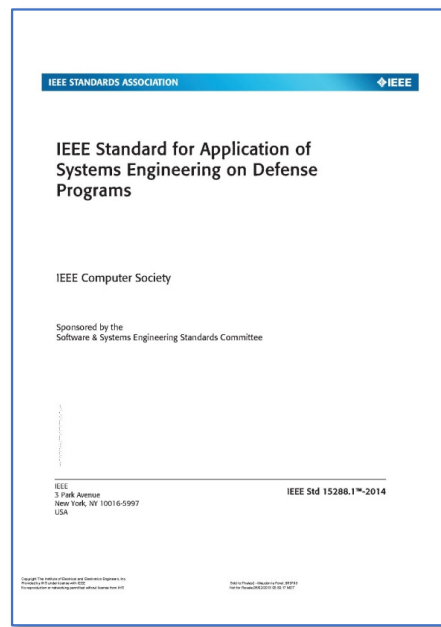
Multiple possible applications of processes along the System Life Cycle

Life cycle processes have to be synchronized when several systems are involved (example for typical enabling system with regards to Sol, and same kind of concerns for SoS...)

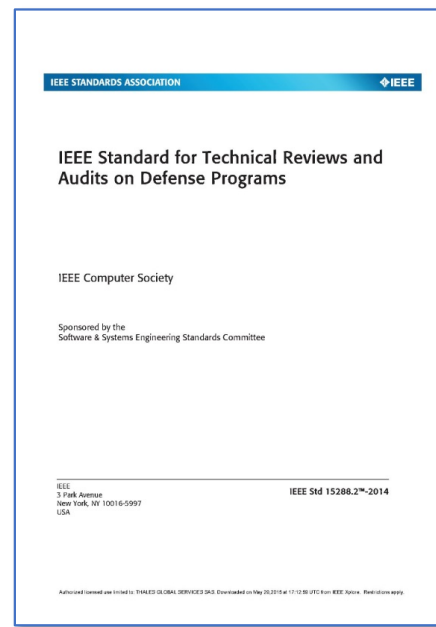
Standard application for specific domain or usage : Major references... **under revision**



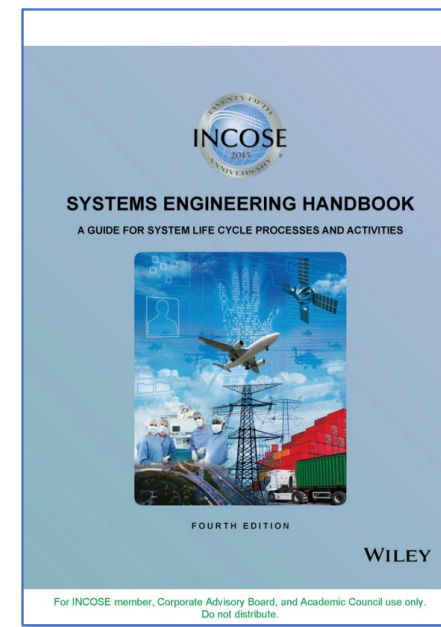
ISO/IEC/IEEE-15288
(Standard = requirements
for any domain)



(IEEE-15288-1) ISO/IEC/IEEE 24748-7
(Standard = requirements
for US Defense domain...
at least)



(IEEE-15288-2) ISO/IEC/IEEE 24748-8
(Standard = requirements
for US Defense domain...
at least)



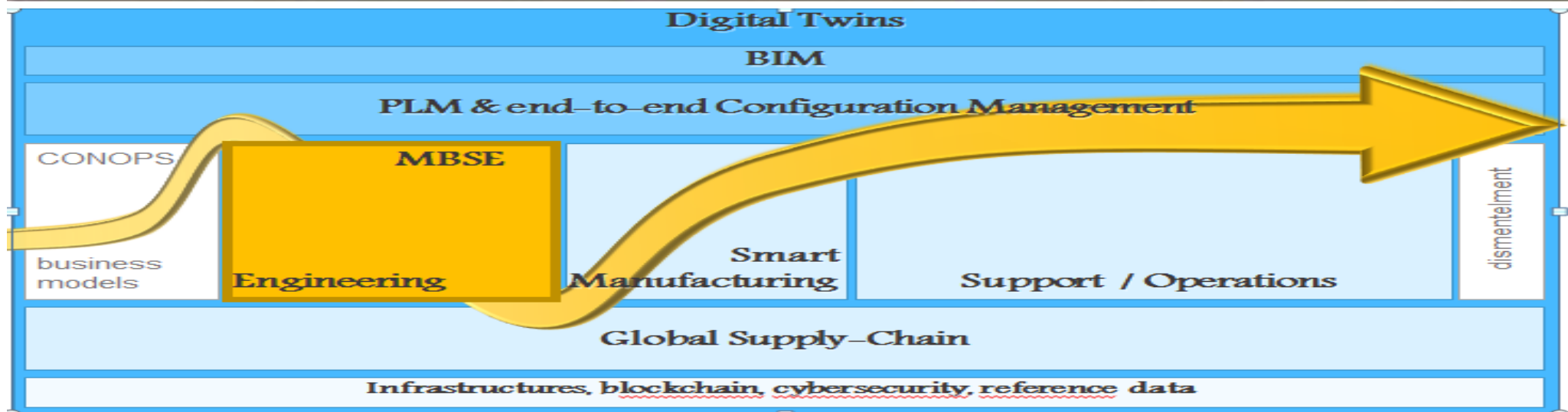
INCOSE SE Handbook
(Guide = state of the art for
any domain)

Scope = System life cycle processes (including systems engineering; but not only...)
Last News : Revision of ISO/IEC/IEEE 15288:2015 (launched in ISO JTC1/SC7)... and SE Handbook V4 (launched by INCOSE)

MBSE versus System Life Cycle Processes

“Model-based systems engineering (MBSE) is the *formalized application of modeling* to support system requirements, design, analysis, verification and validation activities beginning in the conceptual design phase and continuing throughout development and later life cycle phases.”

INCOSE SE Vision 2020 (INCOSE-TP-2004-004-02, Sep 2007)



MBSE not only concerns the development process, and could support each stage of the Life Cycle from concept (e.g. modeling the business & operational needs...) to production, operation, maintenance... where Models are also useful...

Questions
&
Answers



6th and 7th October

<http://standardsdays.afnet.fr>