



AeroSpace and Defence
Industries Association of Europe

AIA / ASD Coordination **January 30, 2019**

Status of **STEP Extended Architecture**

Jean BRANGE
AFNeT

? is STEP a complex sytem that we need to extend and maintain for decades ?



One man
is directly in charge
of all stages from
requirements
to disposal



First STEP dev in 1985

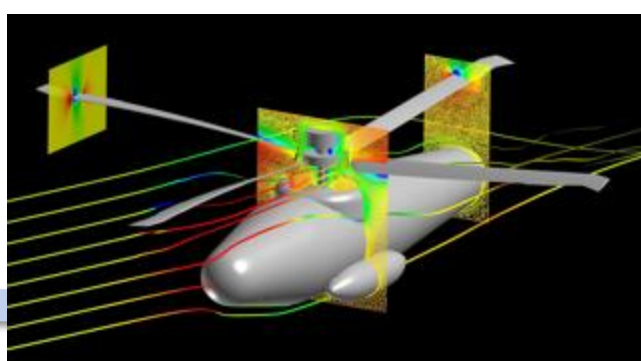


Work specialisation
Multiple human beings
Collaboration needs
*multiple AP with
integration requirements in 1995*



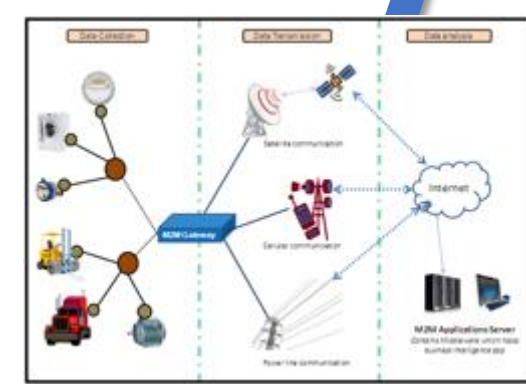
The man & the machine
interfaces

Stepmod publishing
infrastructure for STEP



Complex systems
Computing, MBE

Extended Architecture
for model based
standards dev and publication

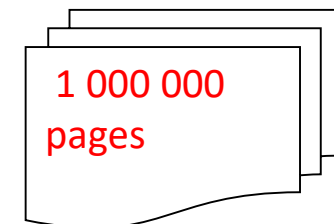


Machine to machine
IoT
*integration
of standards families and
infrastructure
for stronger enterprise
integration*



~ 10 AP

350 Modules
30 CTC > 65000 files



1 000 000
pages

STEP *iso* 10303

Increasing importance of the electronics and electrical simulation, as part of mechatronic systems

- SysML extension to support Physical Interaction and Signal Flow

Simulation specification, to facilitate integration of systems engineering model

- Product Life Cycle → Systems Life Cycle

PLM information

+

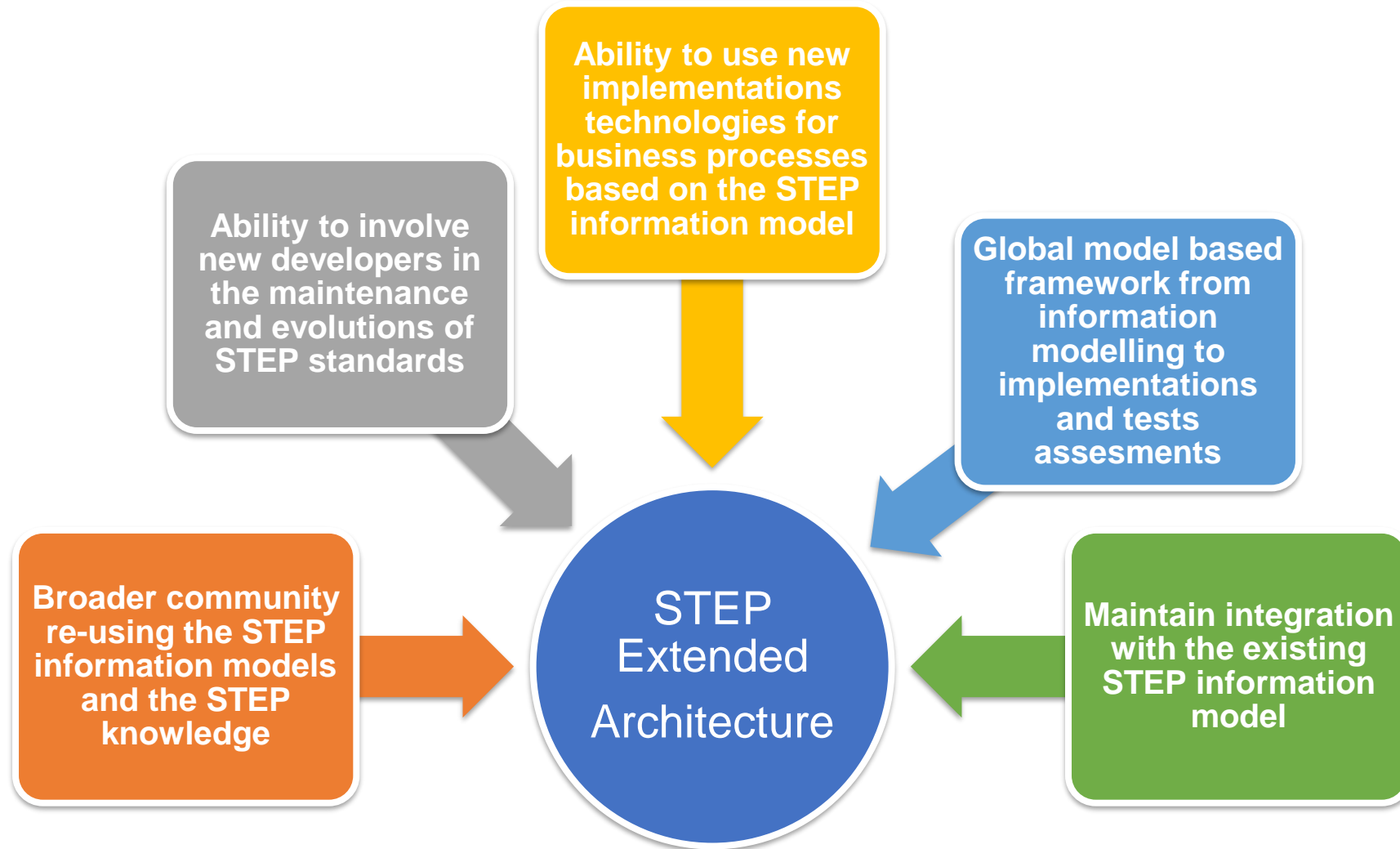
SLM information

Increasing use of SysML!

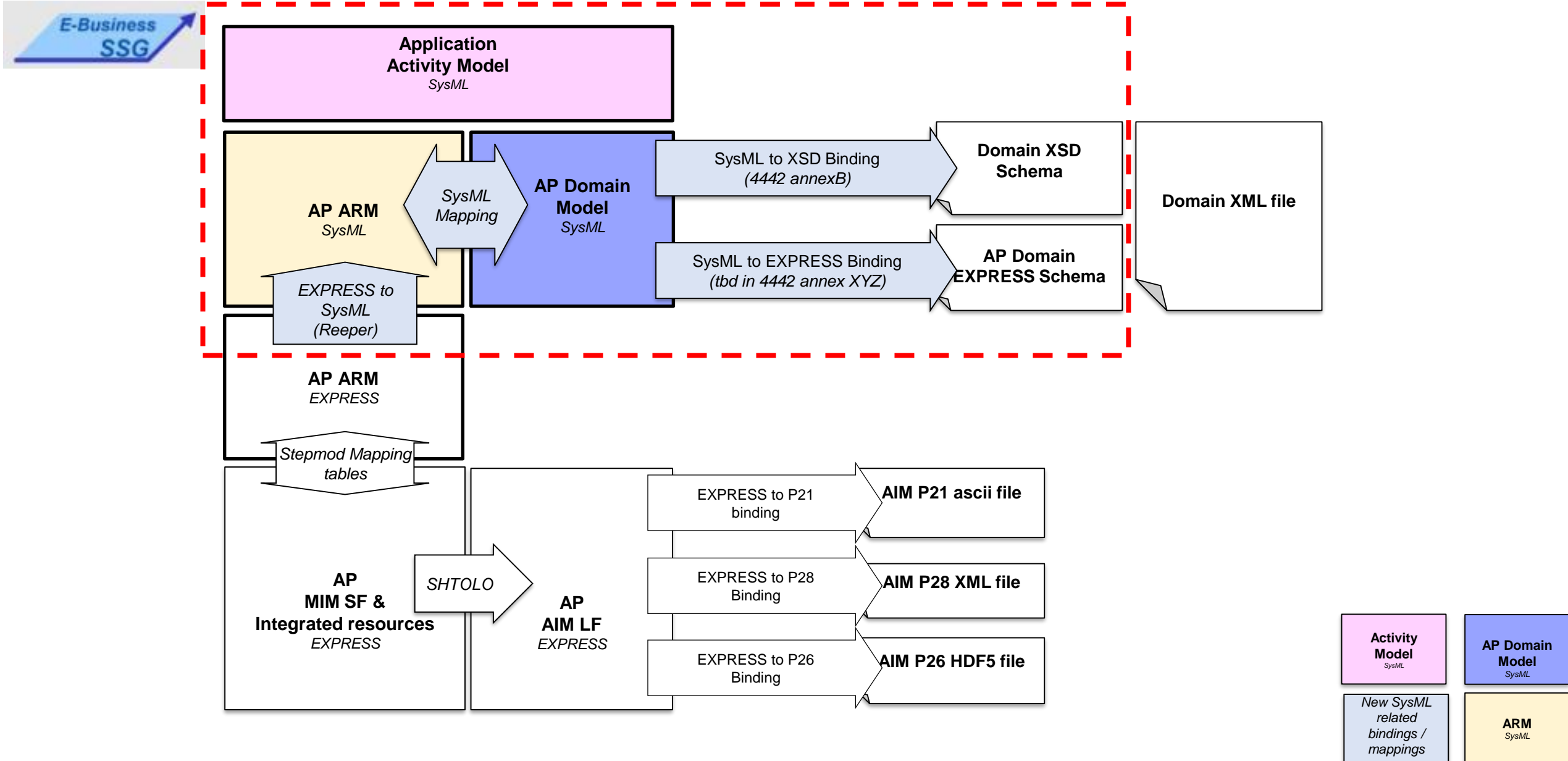
- Systems Engineering → MBSE
- PDES Inc vision: Model Based Enterprise
→ relies on an Enterprise Architecture Framework
: OMG Unified Architecture Framework (Oct. 2016)
- is based on UML and SysML

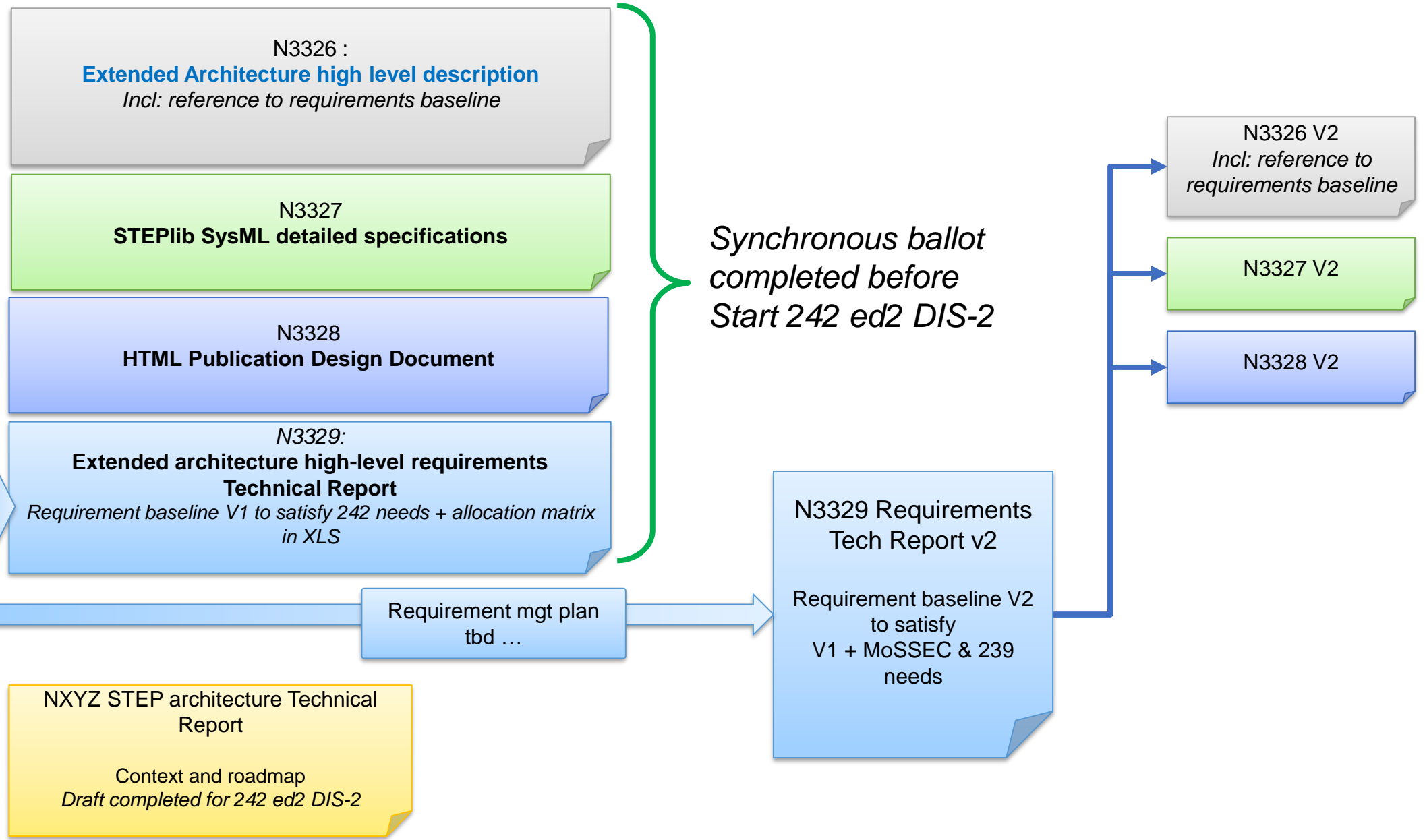


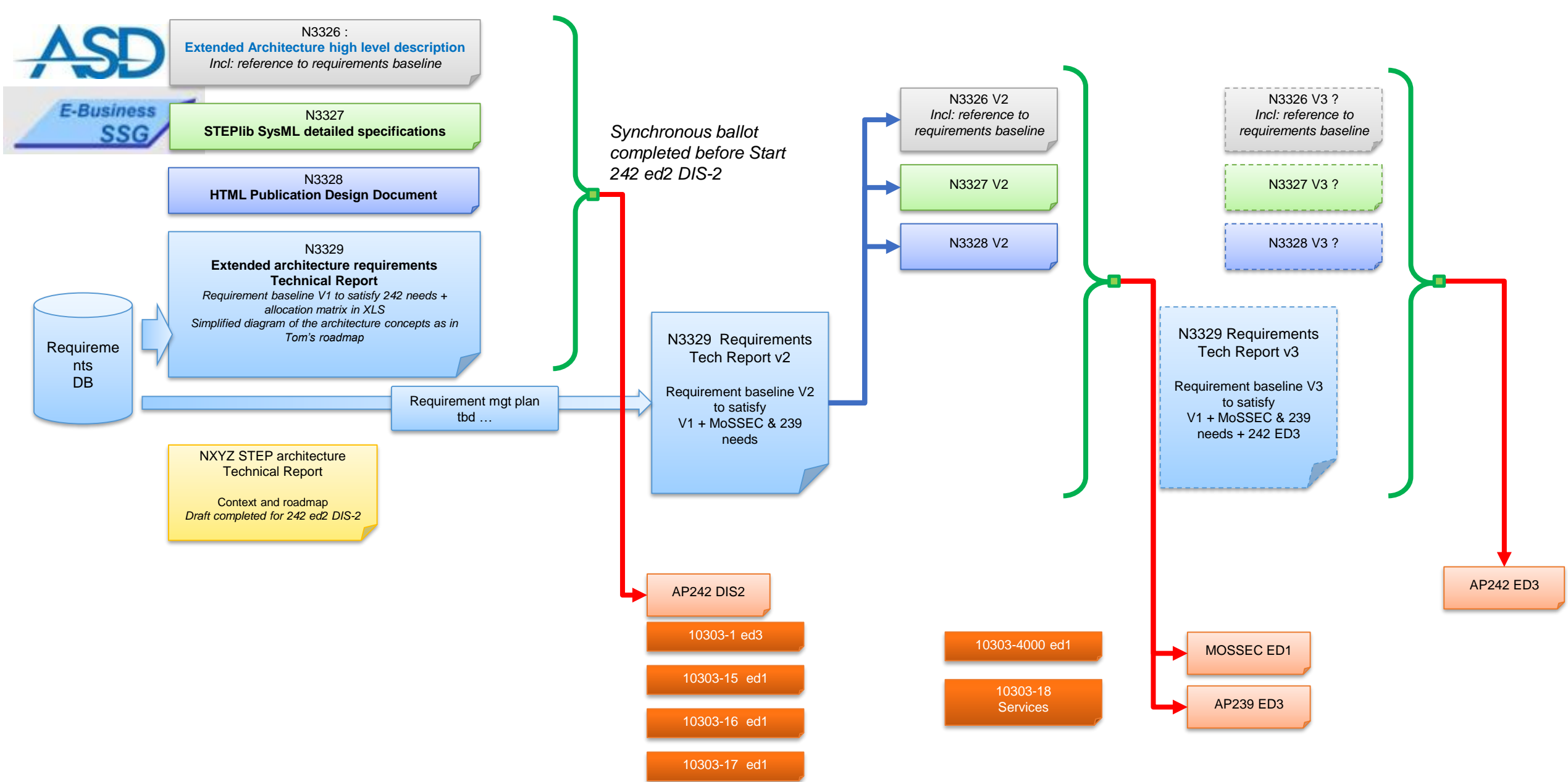
Requirements of the STEP extended architecture defined during Feb 2014 Workshop



Scope of the extended architecture for AP242ed2







NWI 10303-15 : Description methods: EXPRESS to SysML XMI binding

NWI 10303-16 : Description methods: SysML XMI to XSD binding

NWI 10303-17 : Description methods: SysML XMI to EXPRESS binding

ISO NWI voted YES
Jan 14, 2019

mandatory for
4442 validation

NWI new part : Implementation methods: SysML XMI to JSON for REST binding

NWI new part : Description methods: domain neutral services specification

NWI new part: Part 4000: STEP Core Model

NWI p34ed2: Conformance testing methodology and framework: Abstract test

methods for application protocol implementations

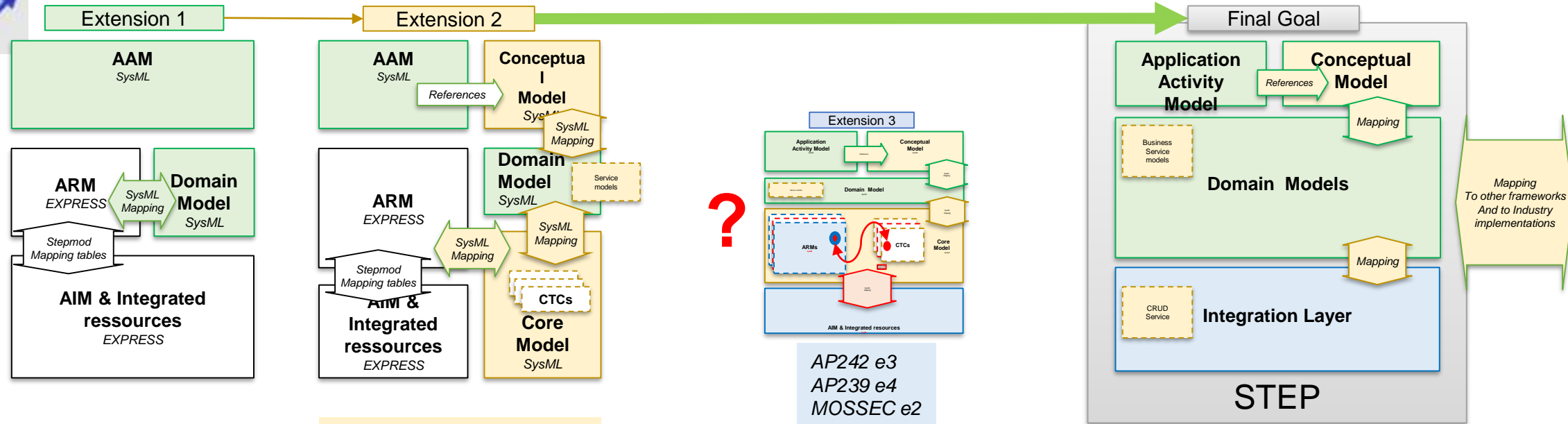
239 and MoSSEC DIS

Working draft needed in May to launch NWI

PWI new part: Description methods: Reference Data Library integration with information models

We do not care yet for 239 , the RDL specification will be contained completely into the 239 Domain Model, and could be based on 1213. no need for a new part.

The PWI is a further integration towards the WG22 activities for larger RDL integration



AP242 e2 FDIS

Extension 1 introduces
AAM in SysML
Domain Model in SysML
Mapping from Domain to
ARM in SysML
(March 2018)

AP239 e3 DIS
MOSSEC e1 DIS

Extension 1 had
AAM in SysML
Domain Model in SysML
Mapping from Domain to
ARM in SysML :
Extension 2 adds:
Conceptual model in SysML
Concepts to Domain mappings
Core Model and Core to ARM
mapping
Conformance class in SysML
(March 2019)

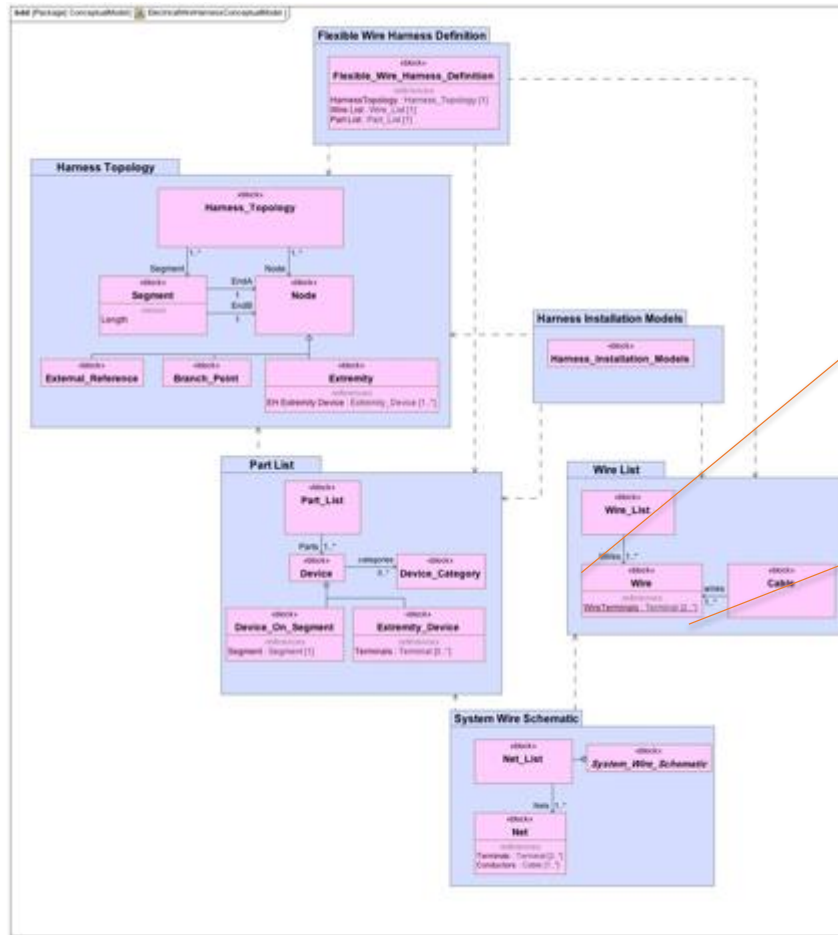
AP242 e3
AP239 e4
MOSSEC e2
AP209 eX ?
AP210 eY ?

Extension 2 had
AAM in SysML
Domain Model in SysML
Mapping from Domain to ARM in SysML :
Conceptual model in SysML
Concepts to Domain mappings
Core Model and Core to ARM mapping
Conformance class in SysML

Extension 3 adds:
staged migration of all modules with refactoring in the SysML
framework

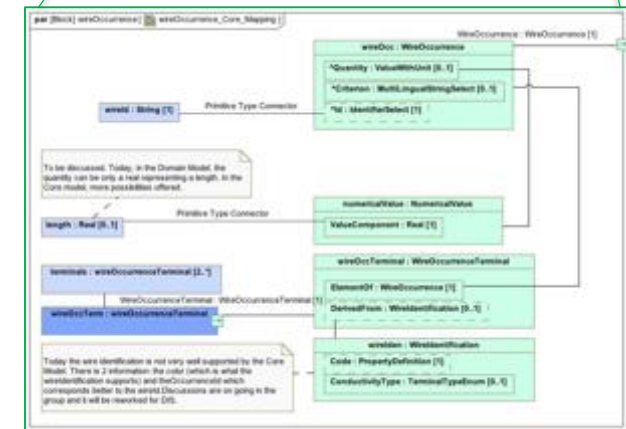
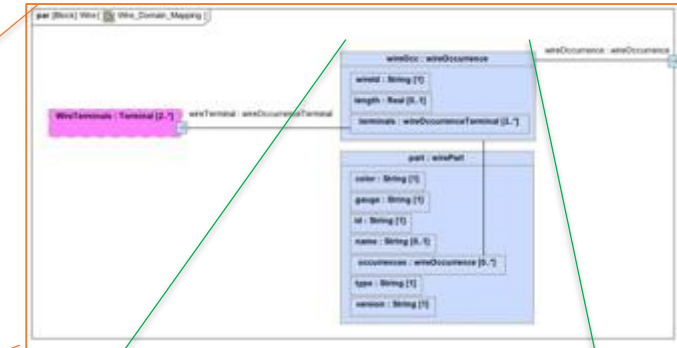
Roadmap to deploy Extension 3 be defined in 2019

AP242 Electrical Wire Harness

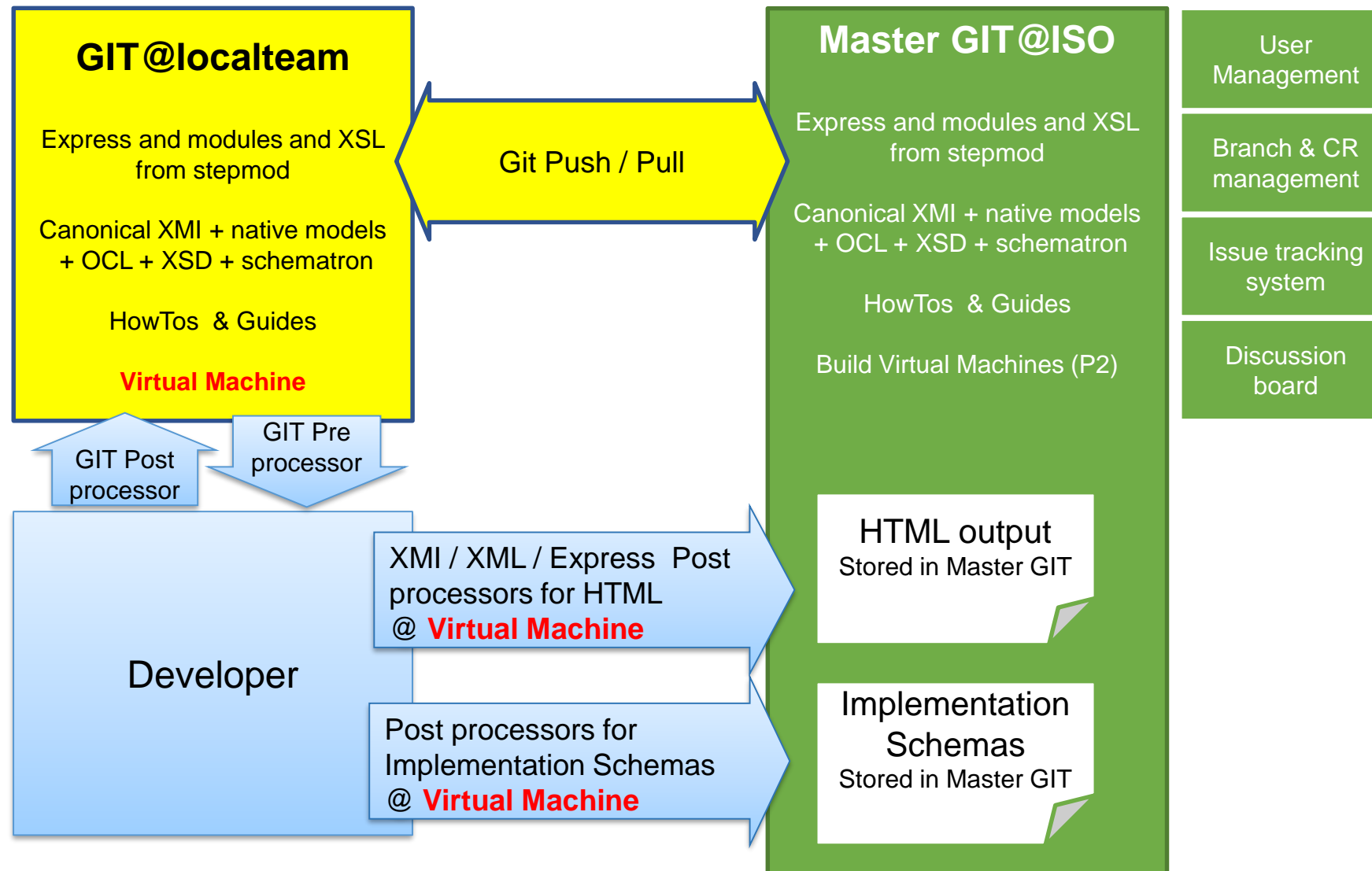


Concepts

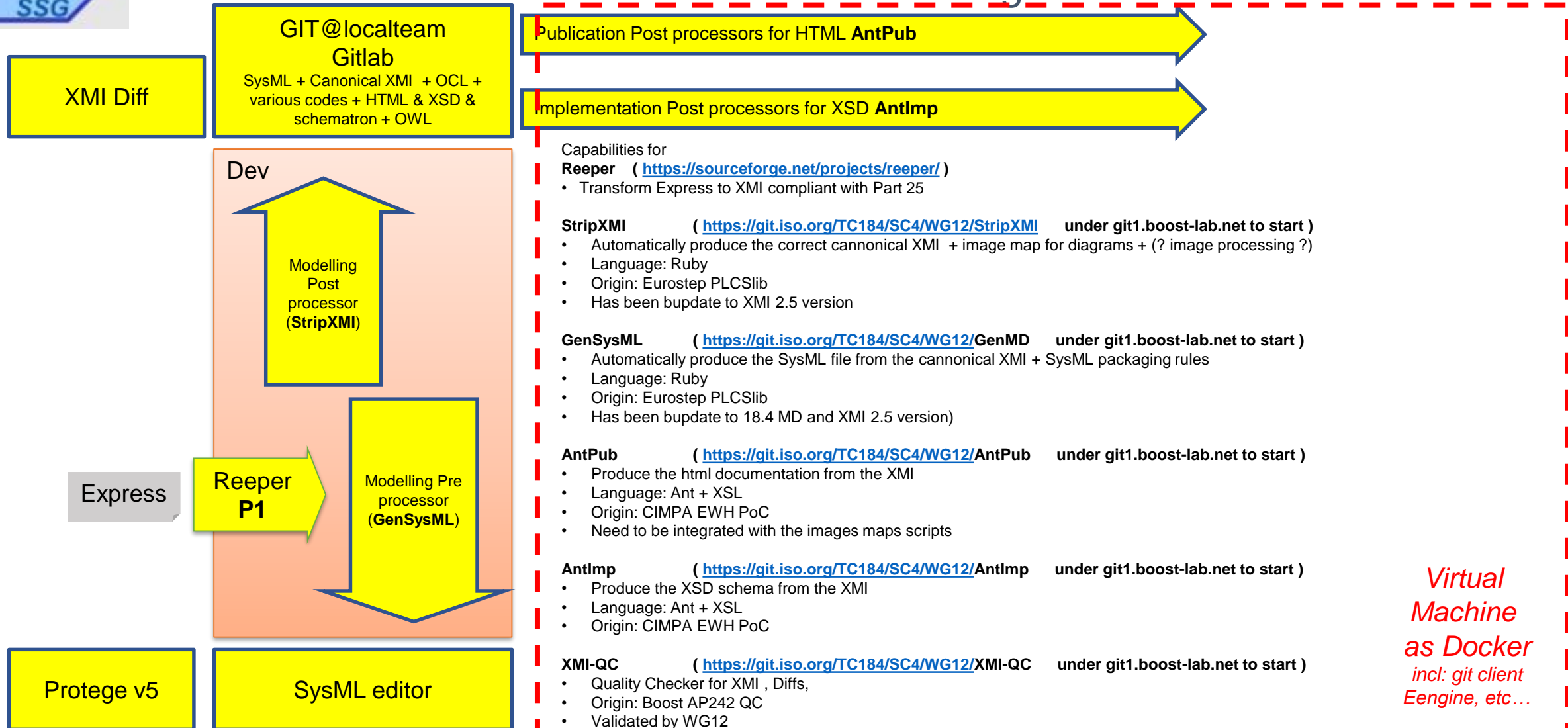
Wire concept mapped to Wire Domain model



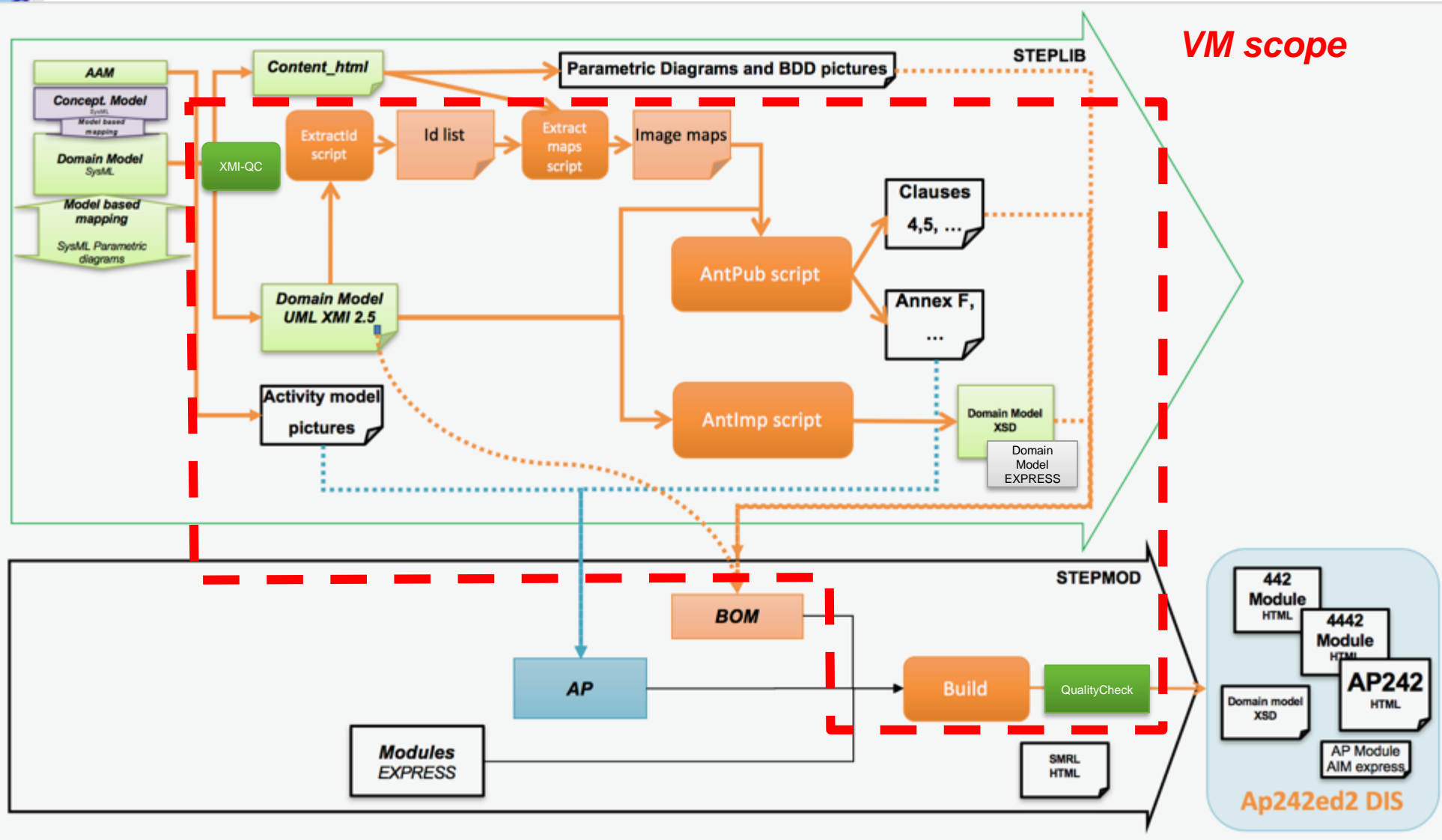
Wire Domain model mapped to Core integrated model



Source control architecture and continuous integration



STEPlib publication toolchain





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AGILE for STEP



Tom Bluhm - PDES Inc,
Jean BRANGE - AFNeT

have clear requirements
Robust commitments of
resources
Portfolio management

Publish the right AP as fast as possible =
less than 24 months

- Right scope answering the industry needs
- Right level of quality
- Ensure consistency of the STEP framework (modular AP)
- Ensure Consensus
- Ensure interfaces/integration with other standards

? Evolution of technologies
versus life cycle of the
standard ?

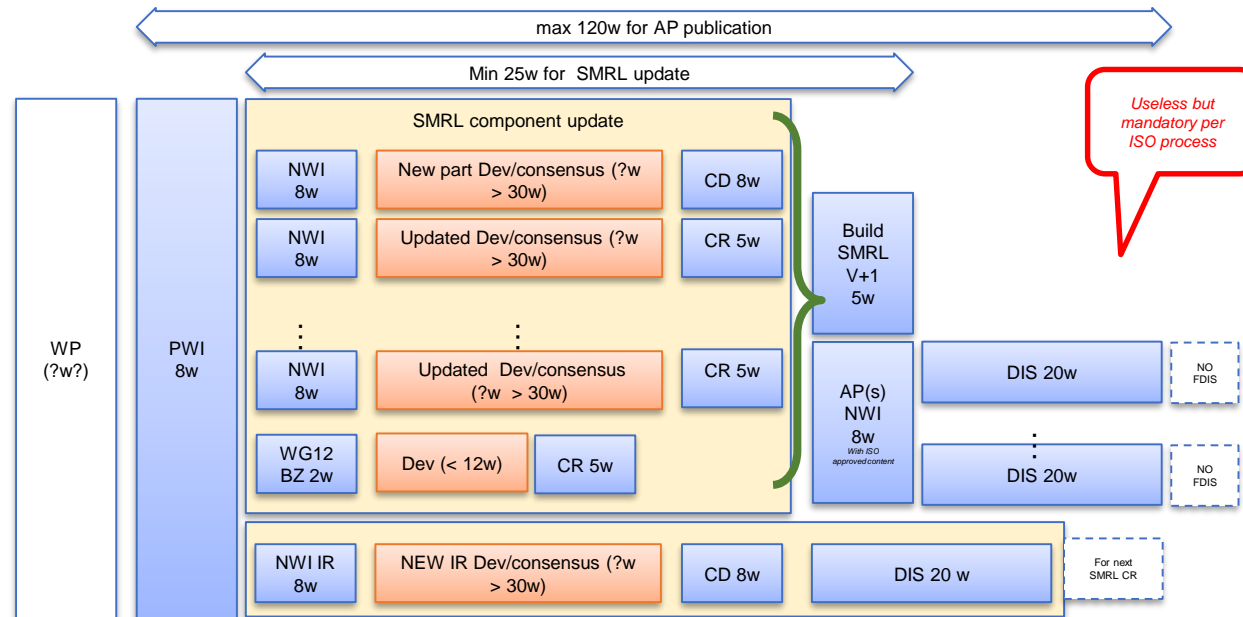
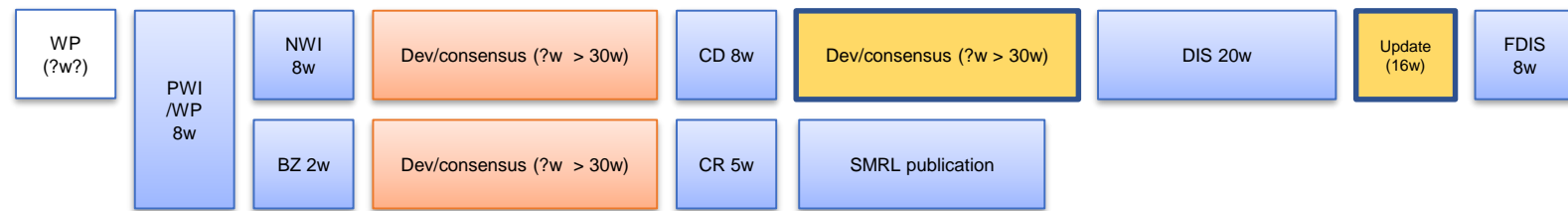
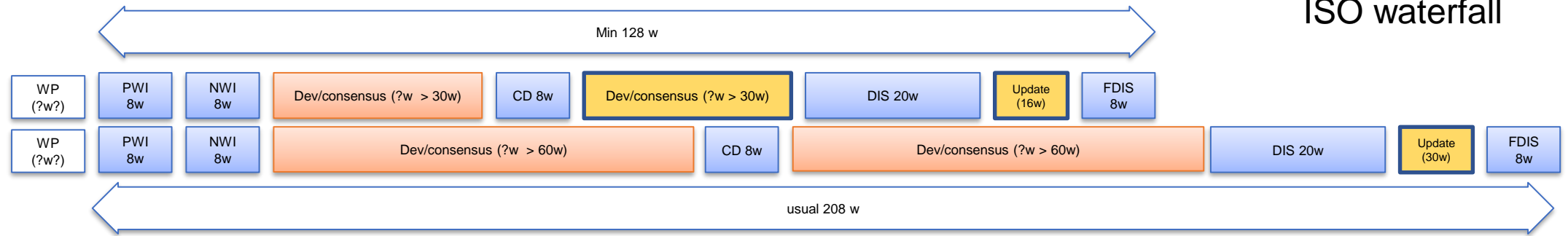
Constraints

Distributed teams
Volunteer work
No-full time commitment
Contradictory requirements
Consensus based
STRONG upward compatibility requirements
Specific backward compatibility requirements
Moving of ISO publication requirements

Context

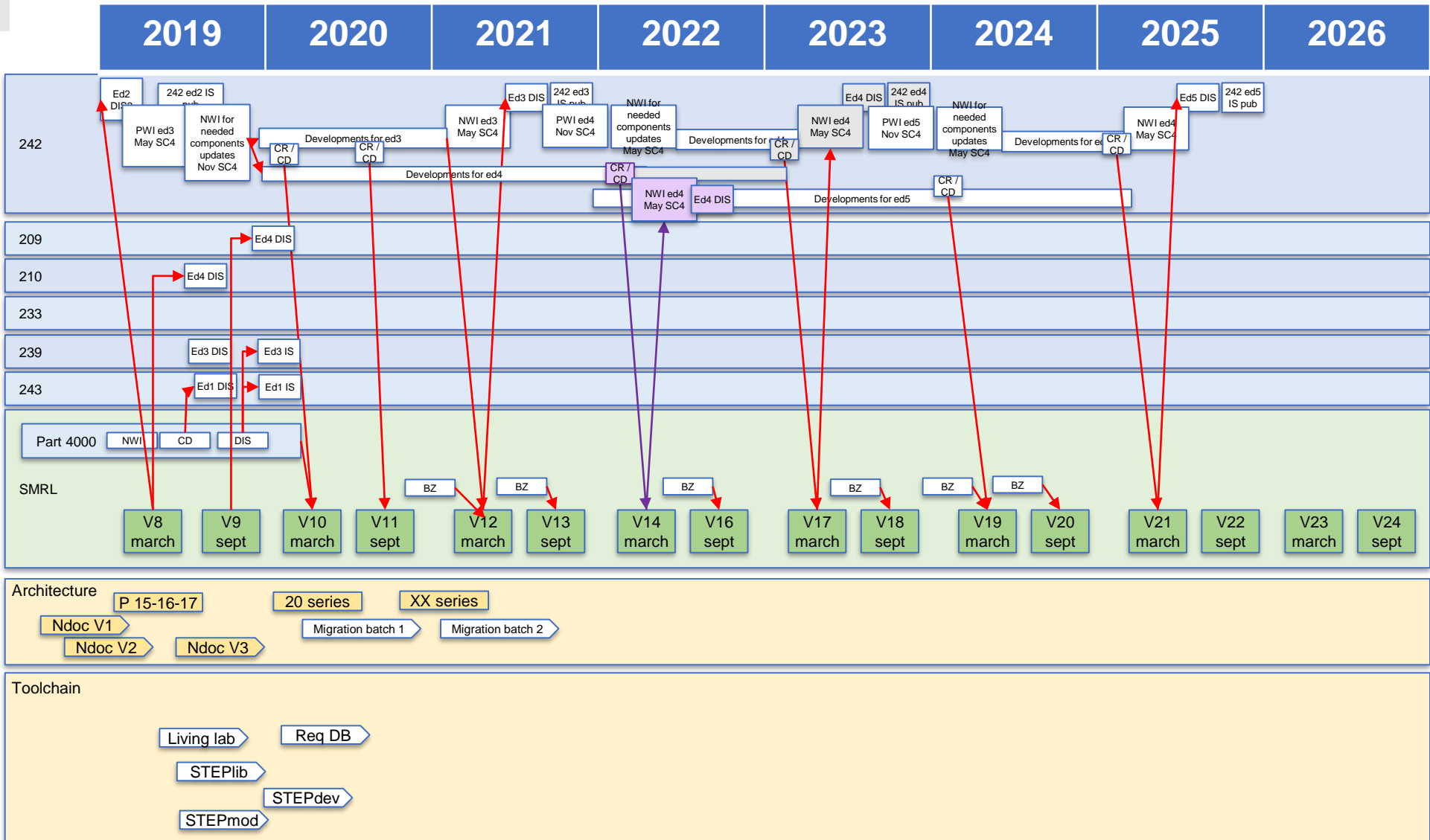
Existing Quality issue
Existing process is Fuzzy
Toolchain not at expected quality level

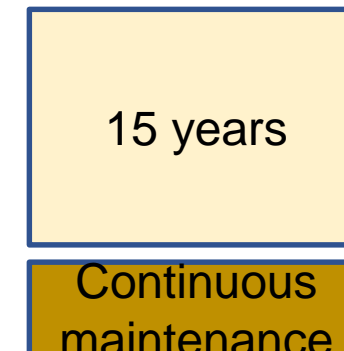
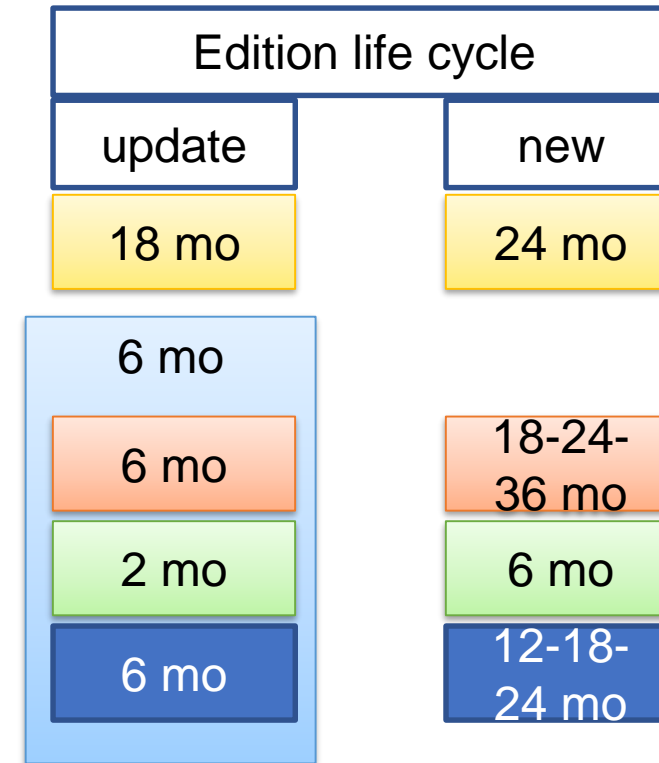
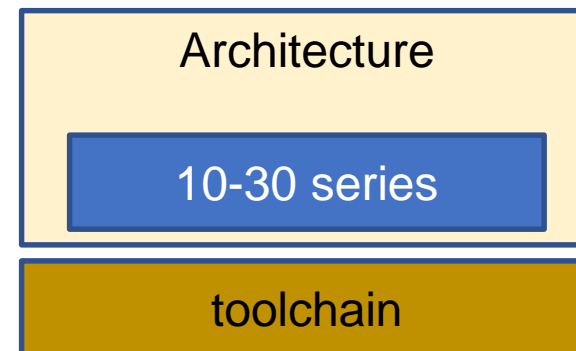
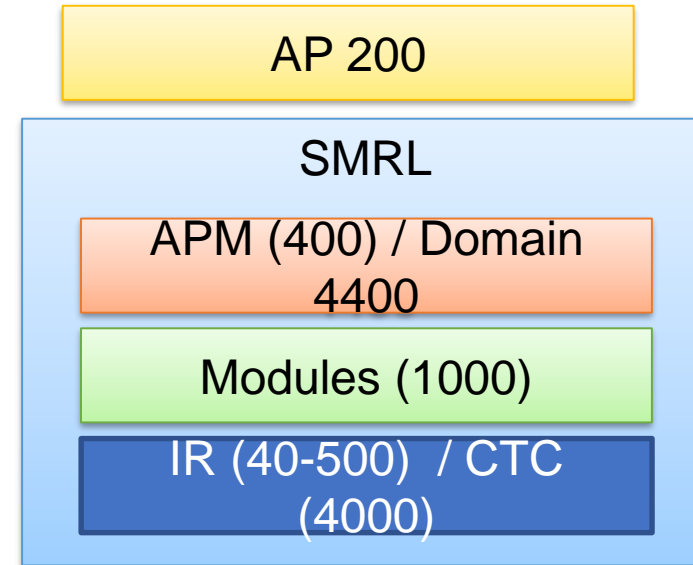
ISO STEP development cycle



Optimisation A

Example of development rollout







1. Development configuration management and collaboration toolchain
2. Publication configuration management and toolchain
3. Consensus and Validation process
4. Proposals (PWI & NWI)
5. Requirements Management
6. Portfolio management (stakeholders)
7. Project management (project team management)
8. Resources management

Mapping of the SC4 organization and processes on SAFE

