Certification

What can be done to make it easier?

David Riemer

Global Product Data Interoperability Summit | **2022**

Executive Consultant to Siemens

Siemens Digital Industries Software
VP, Aerospace and Defense Strategy
- Responsible for ensuring products meet A&D requirements

35 years program management and engineering senior leadership roles
Raytheon Aircraft (Beech Aircraft)
- VP, Government Business Division
- Led successful bidding and execution of the Joint Primary Aircraft Training System (T-6A Texan II) for the USAF and USN

- VP, product development and **e**ngineering
- Responsible for all commercial aircraft product development and engineering

ATK Launch Systems
VP, Science and Technology and Engineering organization
- Organization successfully develop and demonstrate the world's largest solid rocket motor
- Responsible for RSRM Space Shuttle and all ballistic missile solid rocket motors

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Main elements of certification

- Criteria/Standard – drive design and process
- Controls – ensure appropriate design and process
- Verification – complete traceability from requirement to compliance documentation
- Process – process definition and discipline
- Artifacts – documentation of the compliance to requirements and processes

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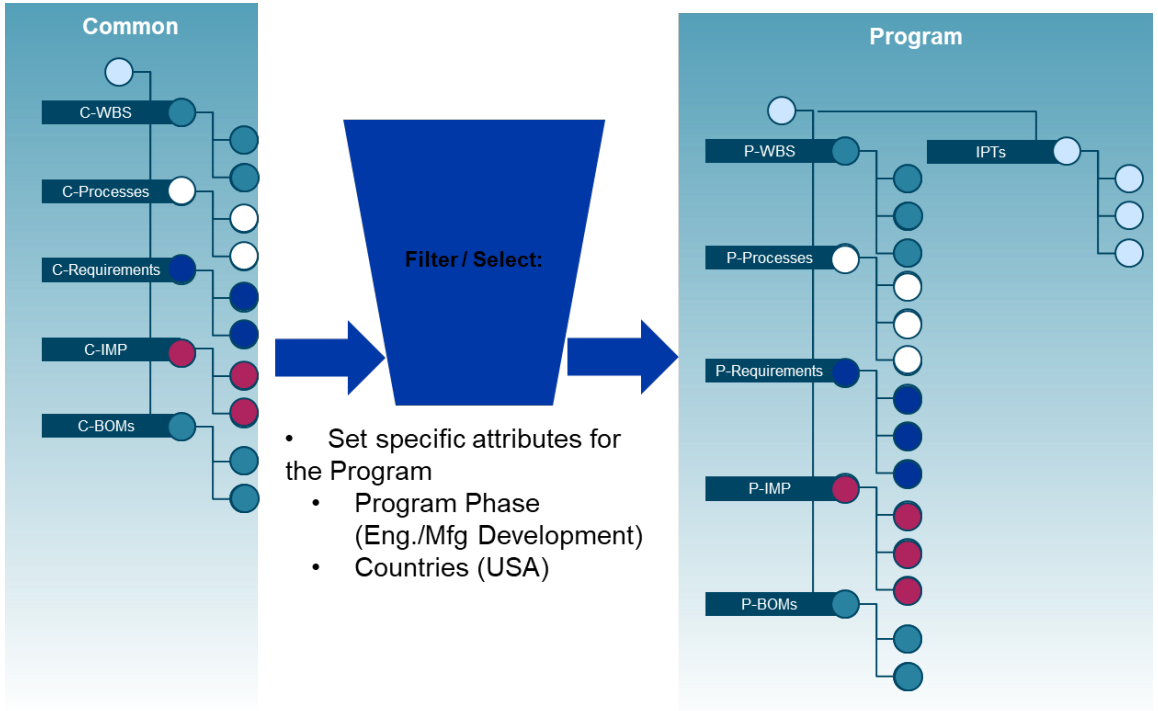
Criteria/Standard – Drive design and process

- Establish “common” requirements that are traceable to the design and to the work breakdown structure
- Complete traceability from criteria to compliance artifacts
- Link certification requirements to supplier logical and physical BOM items
- Configurable certification criteria based on any characteristic, e.g. UAV, Service



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Controls

- Criteria traceable to logical and physical (eBOM elements)
- Criteria traceable to risk including fault hazard analysis
- Criteria traceable to verification methods specific artifacts
- Certification tasks are traceable to the criteria
- Complete configuration on ALL certification elements

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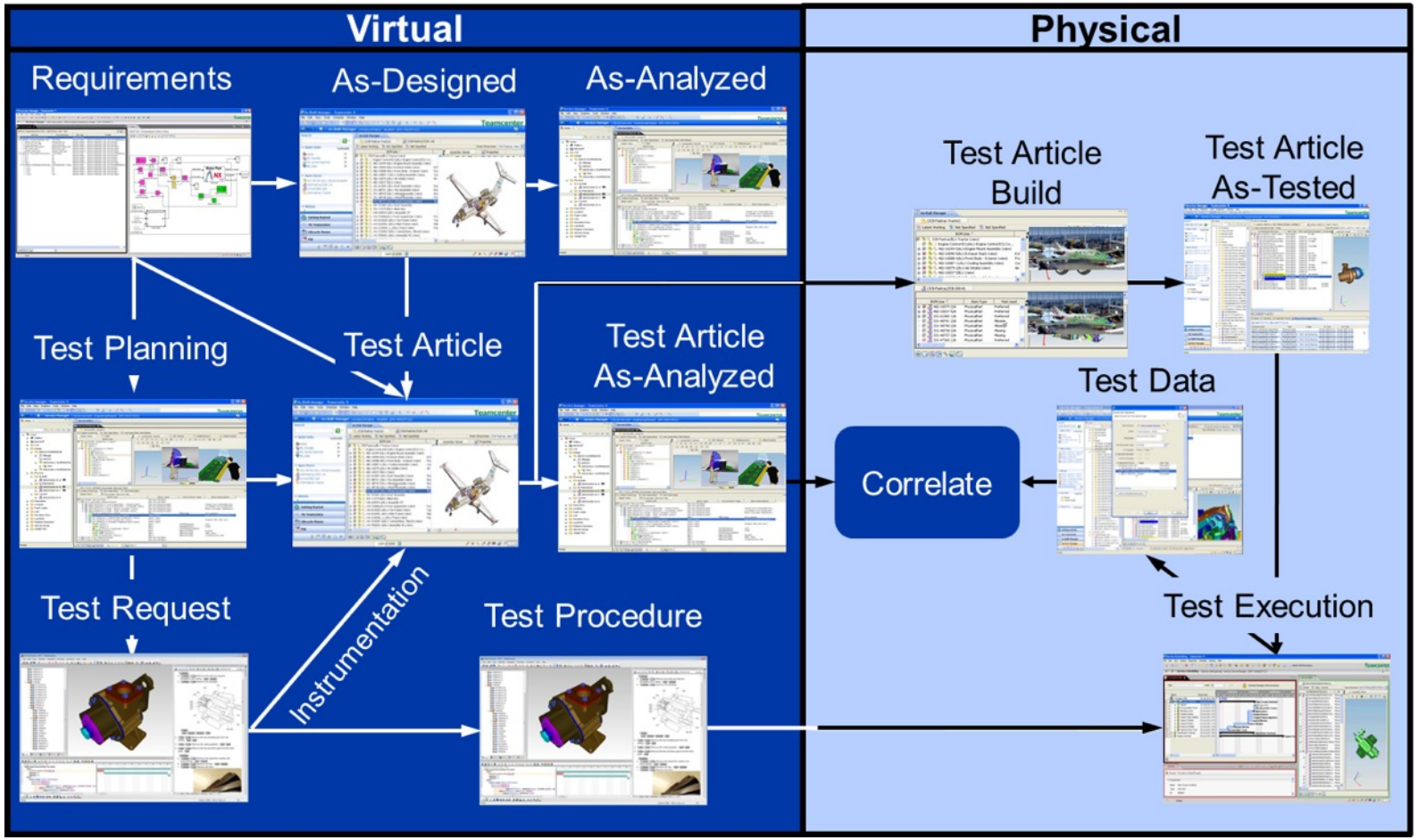
Verification

Complete traceability from requirement to compliance documentation



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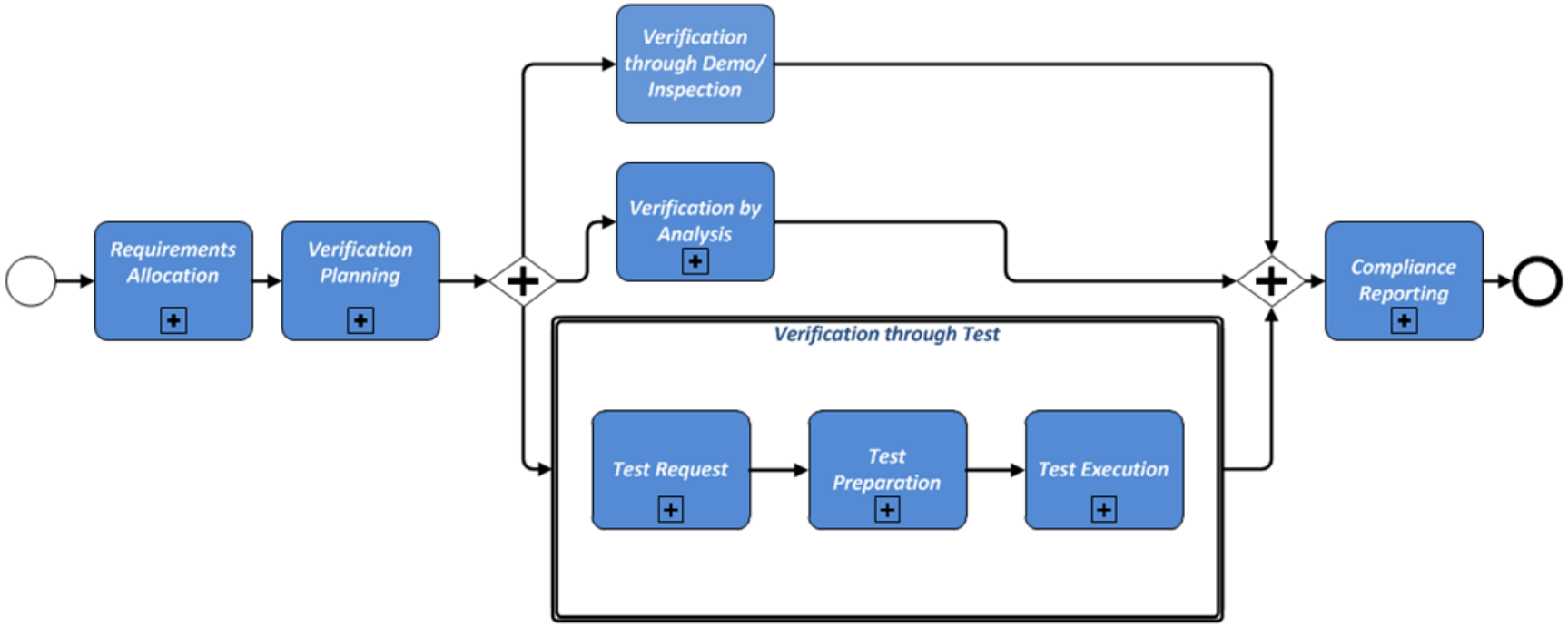
Process definition and discipline

- Incorporate certification work scope into a “common“ WBS to ensure process compliance
- Process standards and company command media are linked to the appropriate work packages
- WBS/Work packages are under configuration management
- Fully incorporate supplier certification tasks in the WBS
- Customer/regulator agency workflows are used to approve compliance



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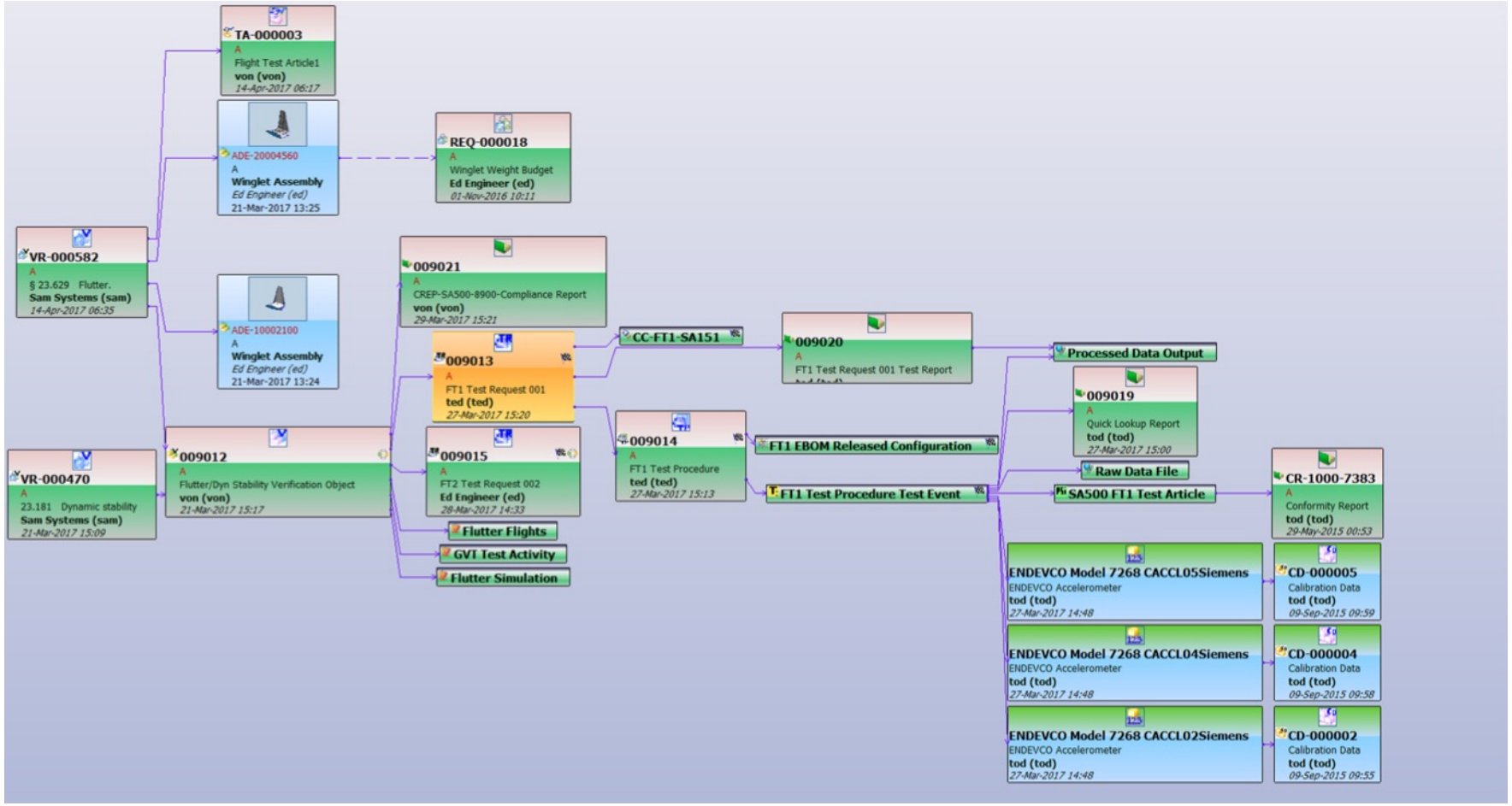
Artifacts – documentation of the compliance to requirements & processes

- Provides complete document (CDRL/SDRL) management tying to the WBS Work Package



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Certification solution features

- Anytime anywhere access – including mobile devices
- Access control for employees, suppliers, regulatory agency and customers
- Single source of truth – no data replication
- Complete integrated configuration management of requirements, WBS, schedule, design, simulation models, test articles and all artifacts
- Integrated certification tasks with WBS and IMS
- Reporting and metric tracking – full, real-time status
- Re-use and comparison of current program to “common” – to incorporate lessons learned
- Immediately available deliverables

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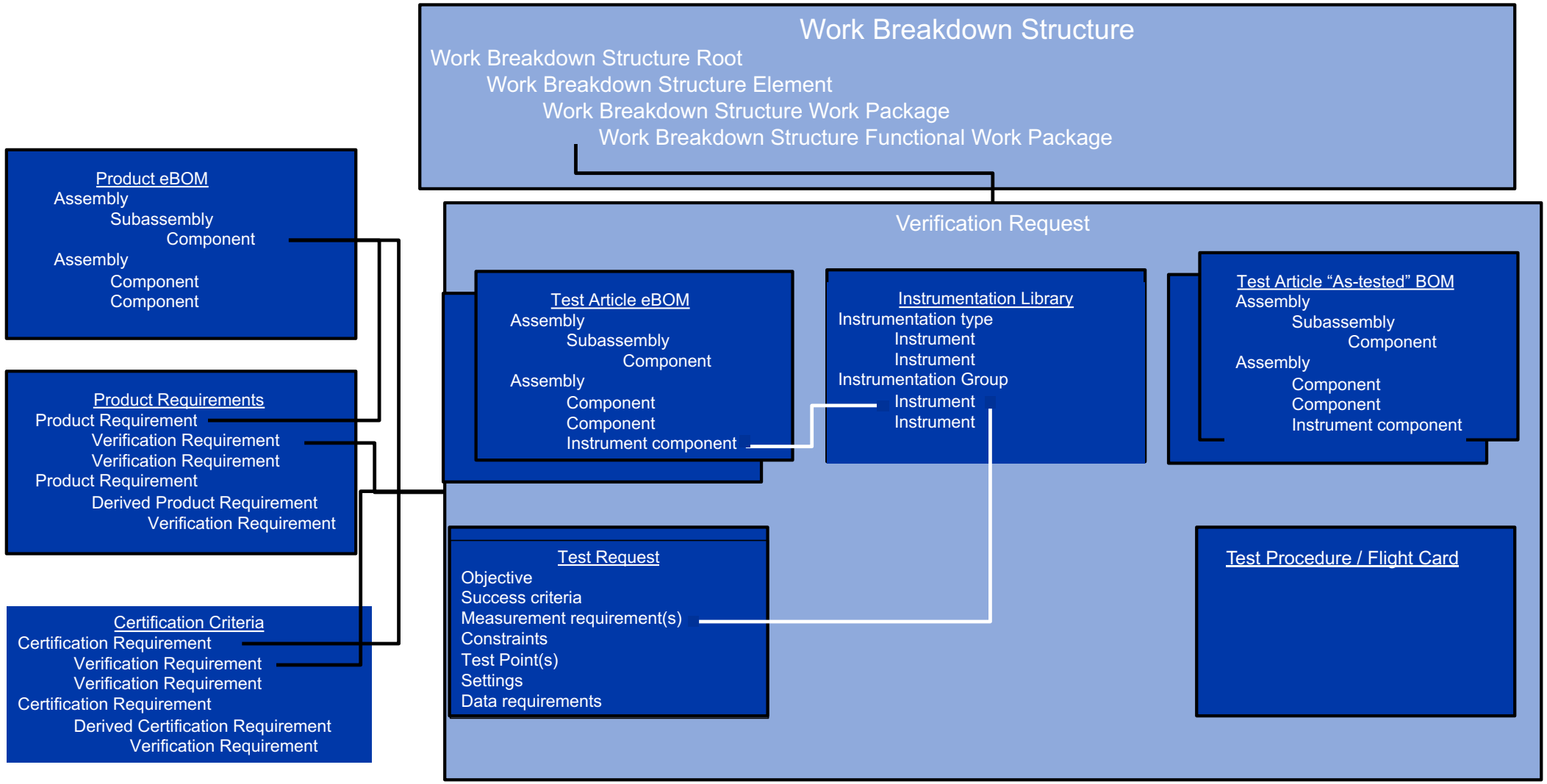
Certification criteria management



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Certification criteria management

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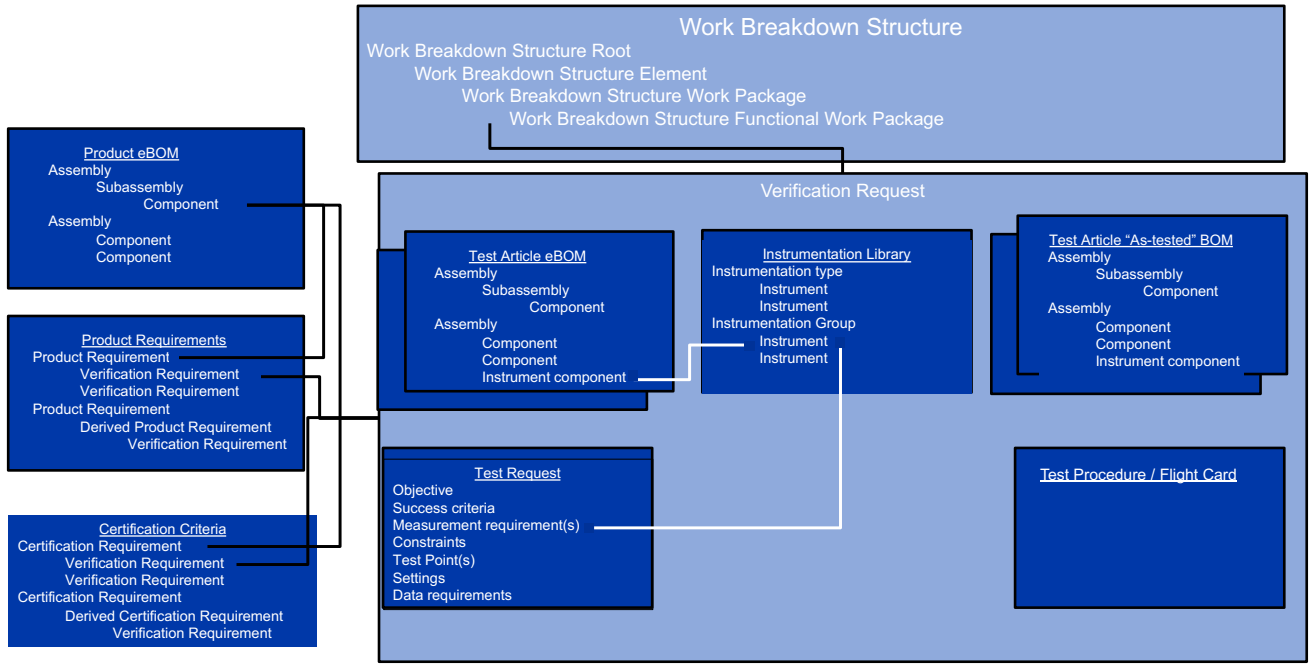

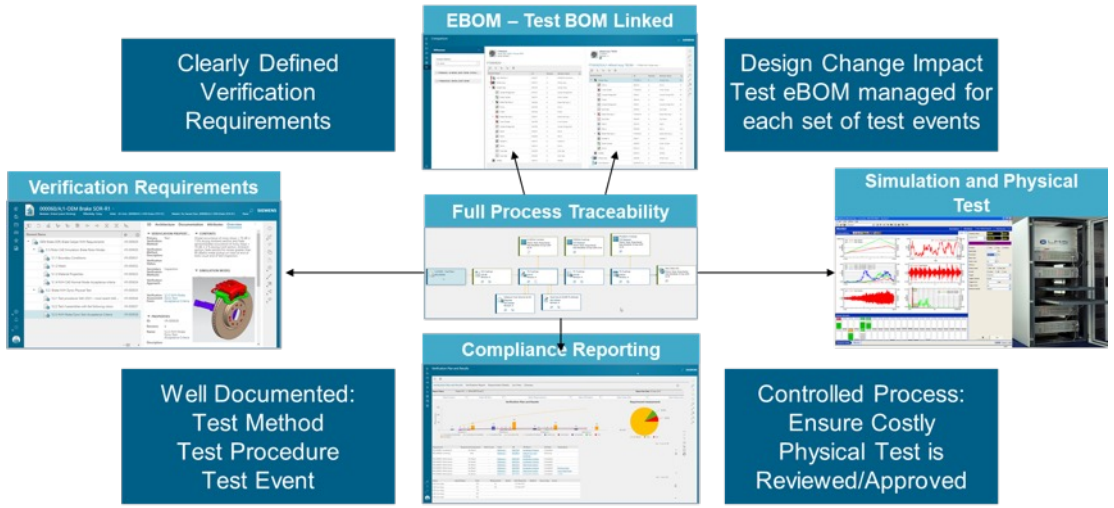

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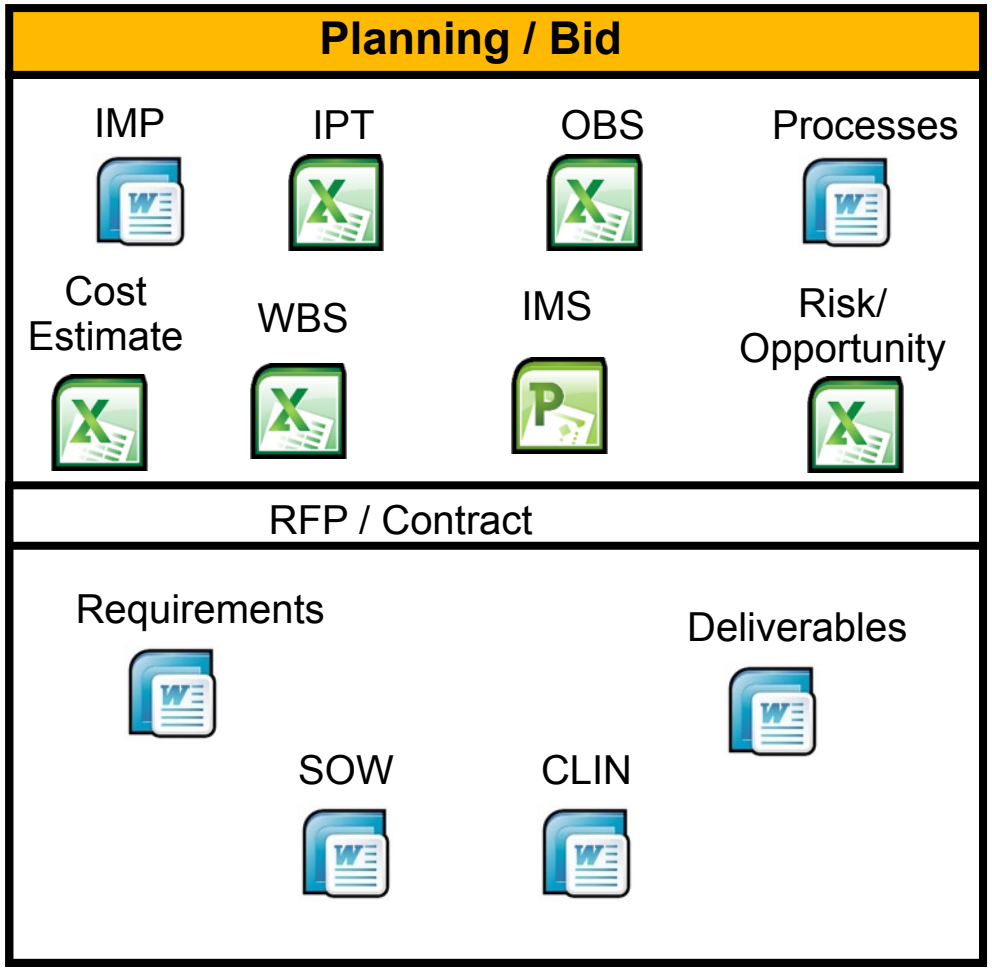
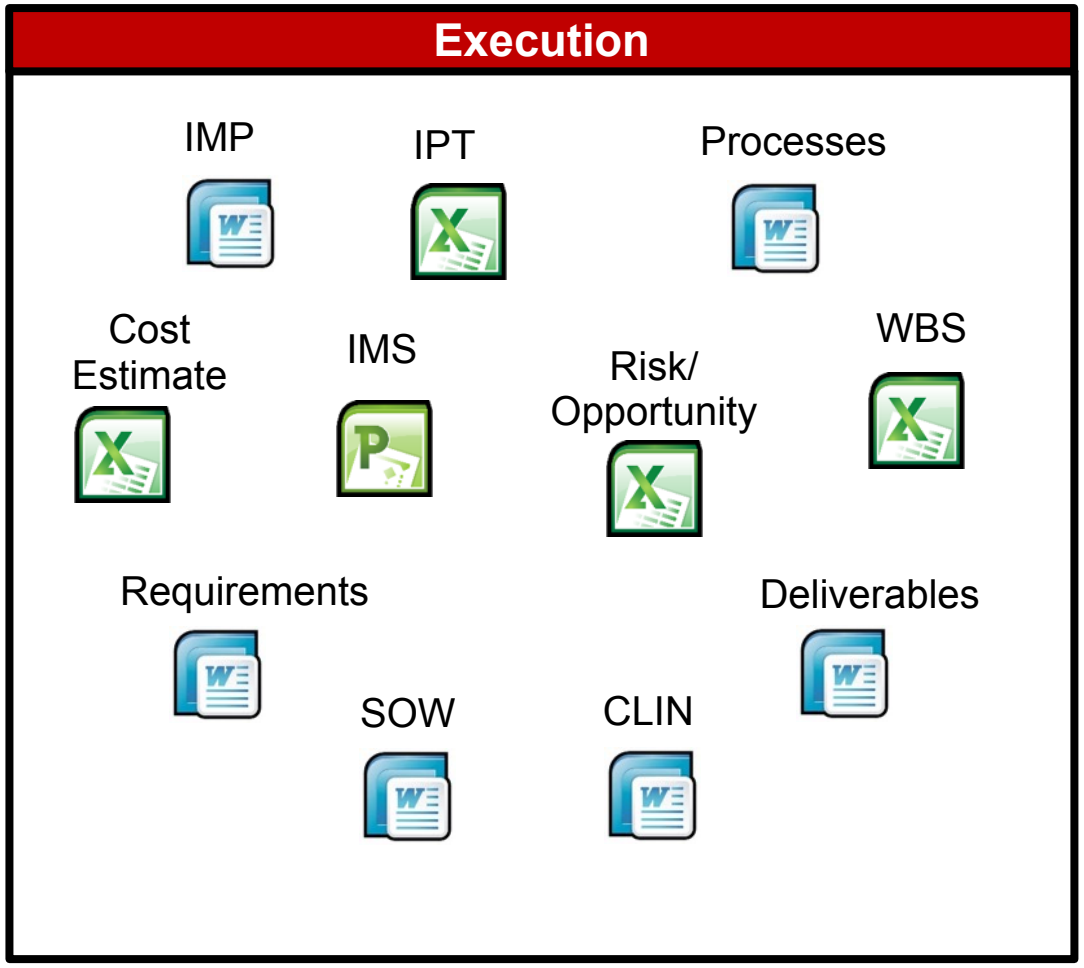
Current program documentation

Separated and disconnected between planning and execution





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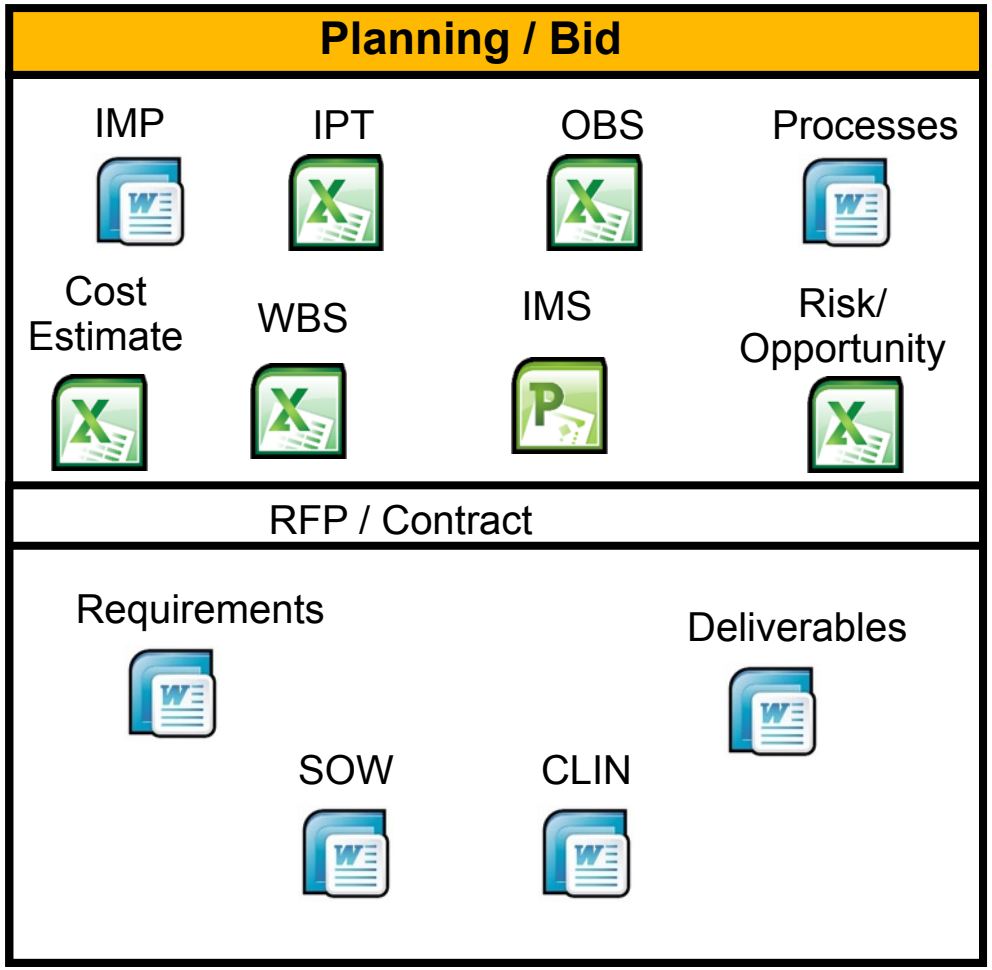
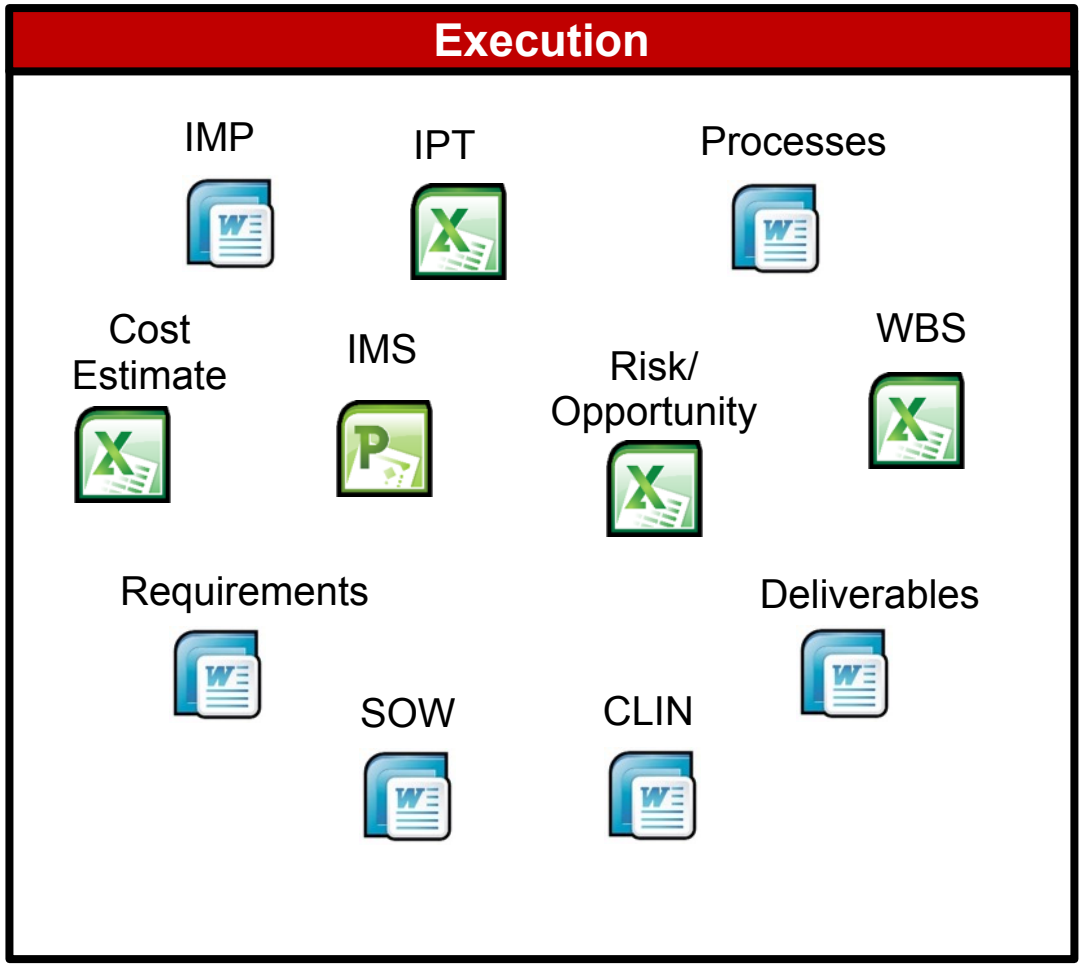


Versions?



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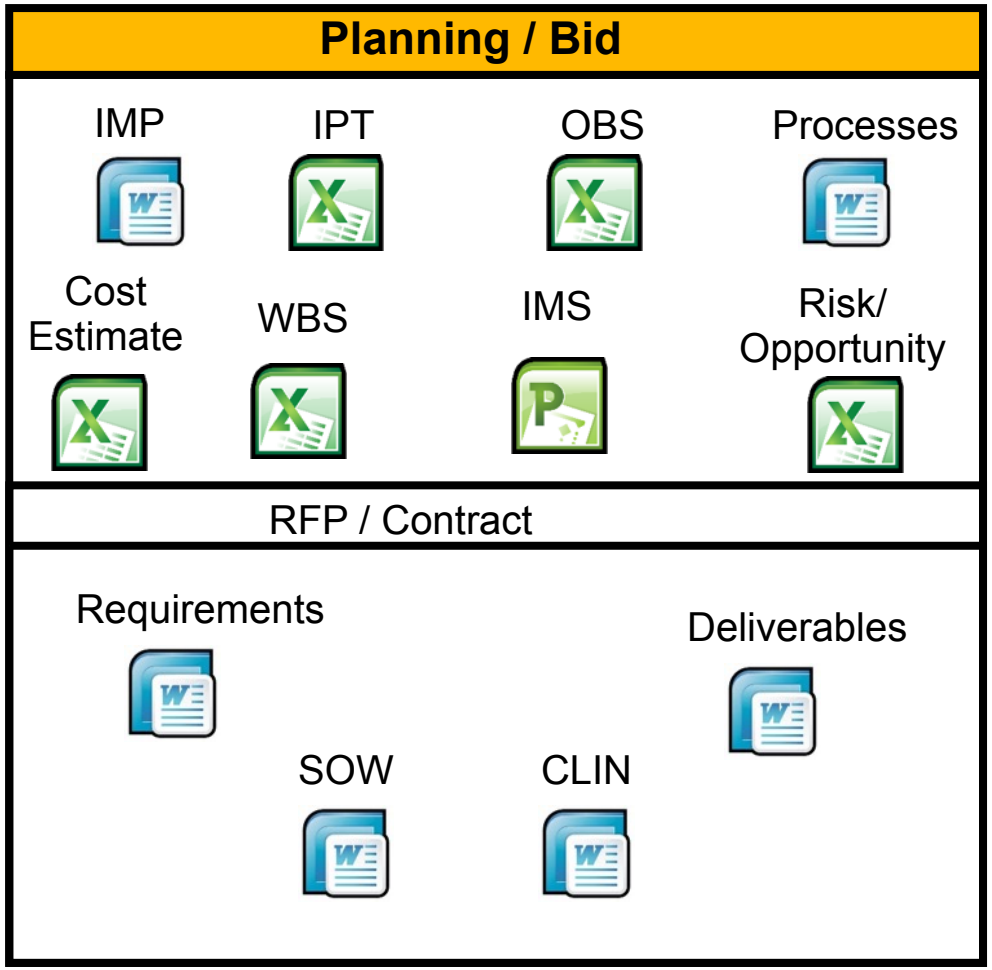

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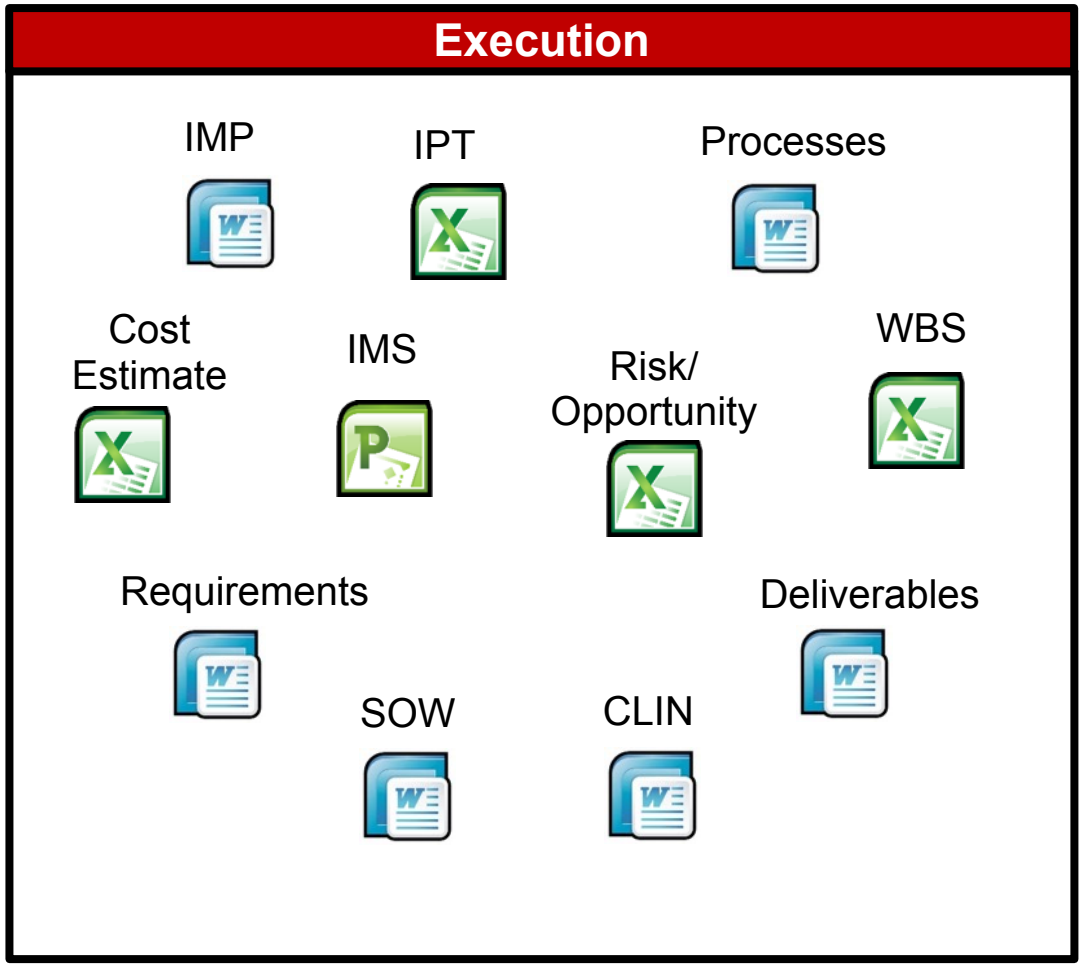

Across laptops and shared drives

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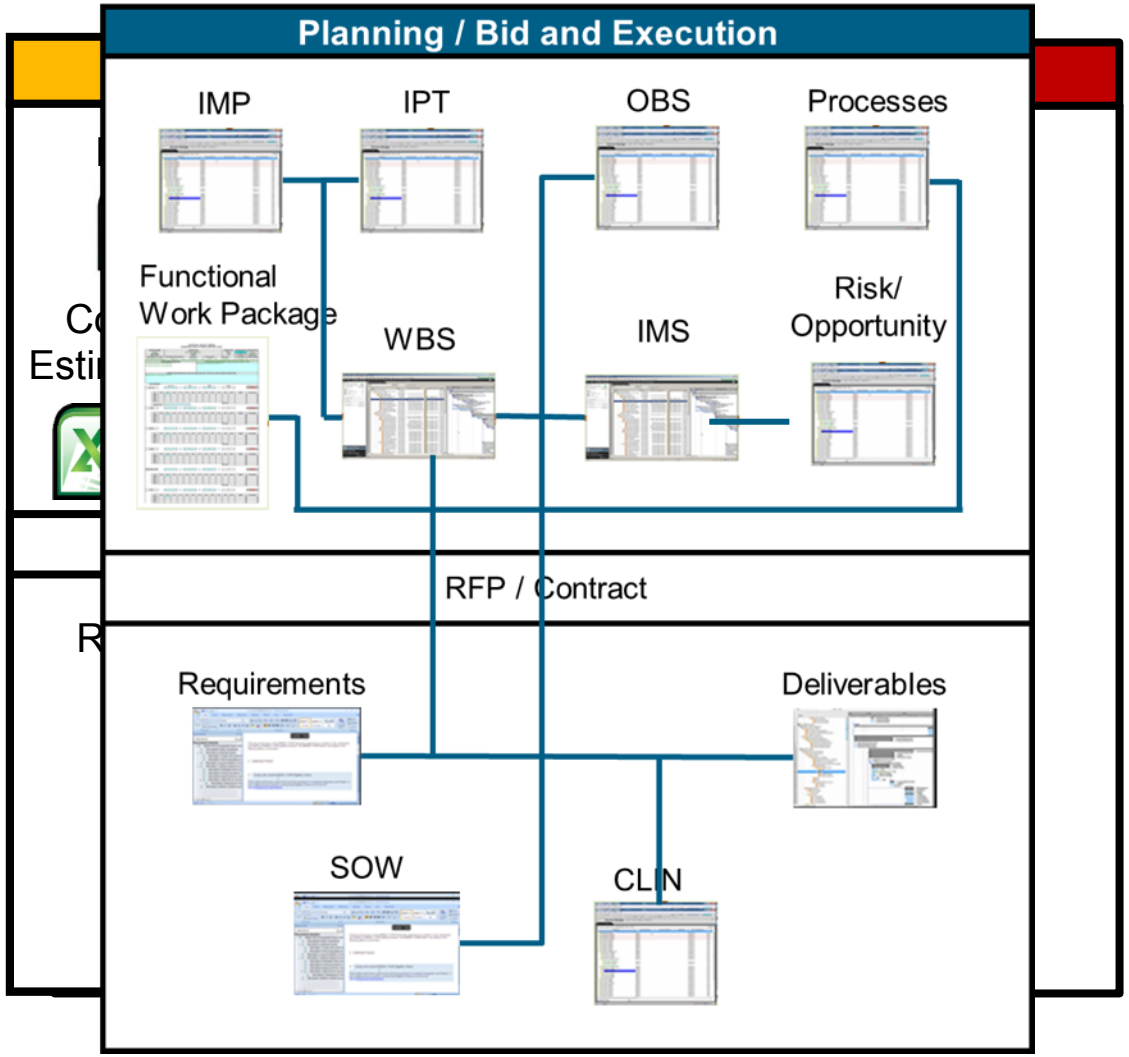
Fully Integrated Program

Information Organized Around the WBS



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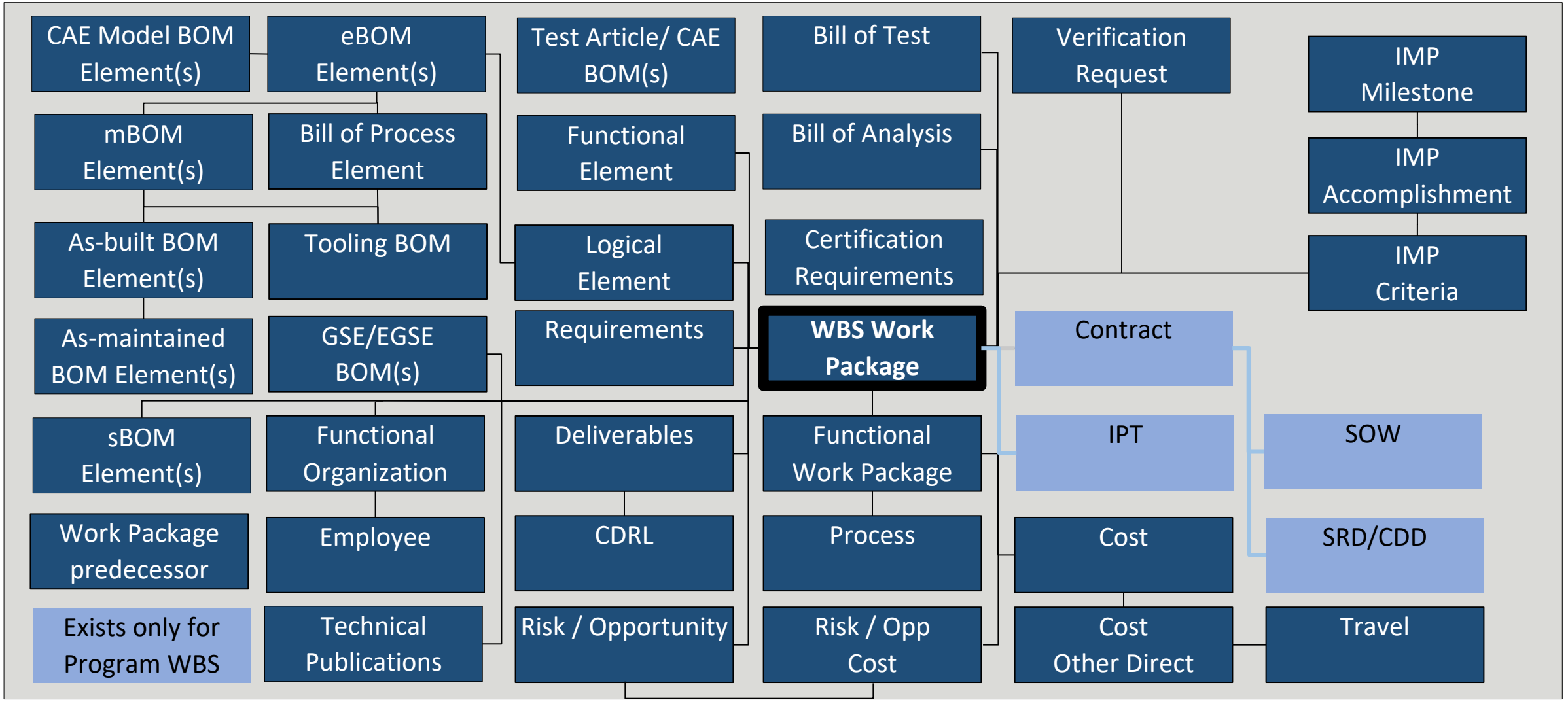
Organize common and program libraries around WBS certification is totally integrated and traceable



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Power of a common WBS

Standardize your work - Certification

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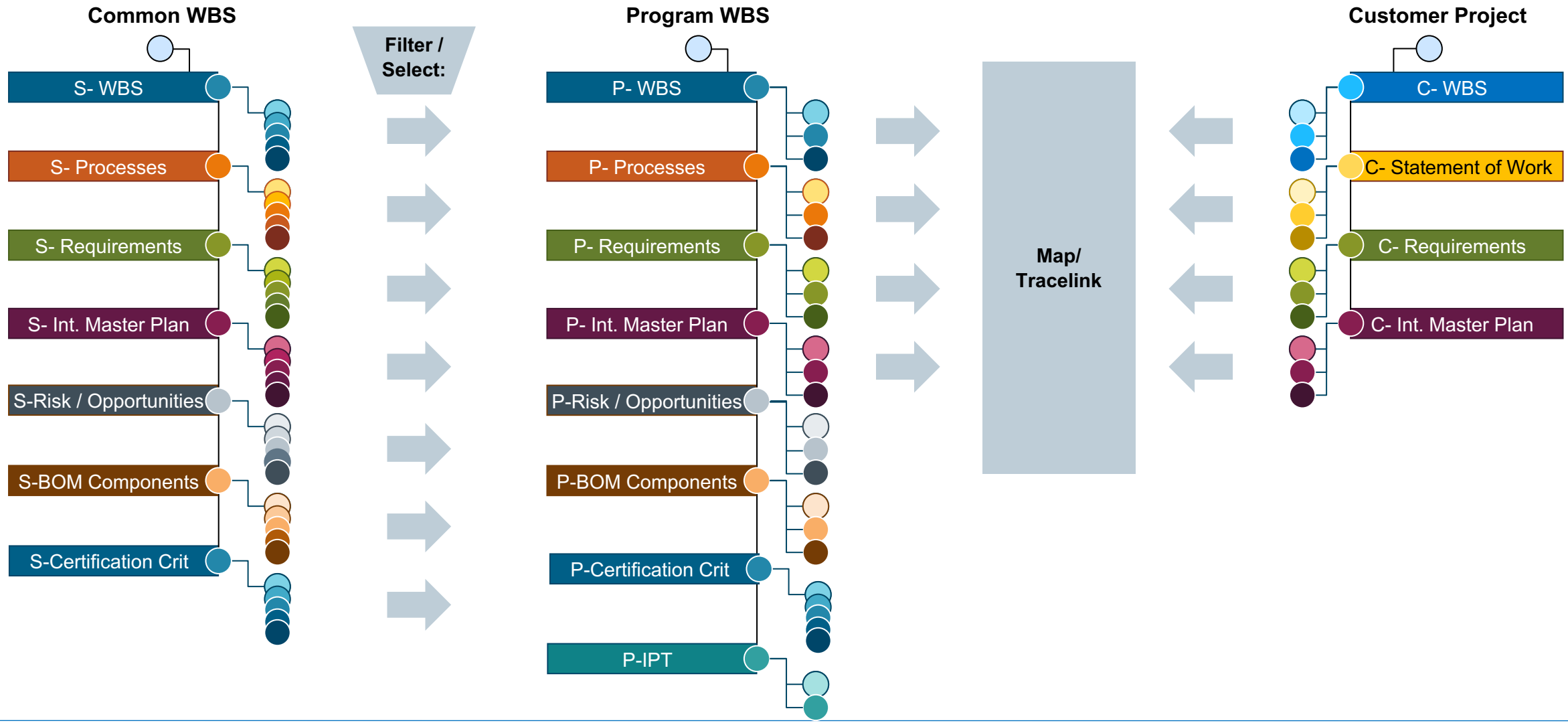

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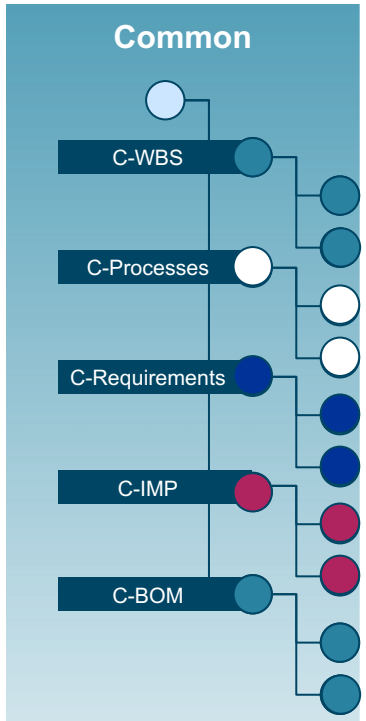
Siemens solution – Common WBS



Common WBS is a repository for the company's history.

- Complete configuration management including history.
- WBS elements can be associated with a set of customer defined attributes to maximize re-use while supporting unique needs

- Can have multiple "Common WBS" structures – radar, missile, etc. The hierarchy and numbering of a WBS (Work Breakdown Structure) varies based on the Product Category (or System).

- Maintaining the historical WBS data based on best practices and lesson learned from the past projects, can greatly help companies quickly realize a specific WBS for an RFP.

- Within the WBS for a specific Category, a WBS Elements with the same number may have different information based on additional characteristics. The additional characteristics can be specified my the customer, an example set could be the following::

  - Program Type (e.g. Fixed Price, Cost Plus, IR&D etc.)
  - Program Phase (e.g., Materiel Solution Analysis, Technology Development, Eng./Mfg Development, Production and Deployment or Operations and Support)
  - Business Unit (e.g. Satellite Business, Launch Vehicle etc.)
  - Platform Type (e.g. Tanker, Transport, Special Missions, Trainer, Bomber etc.)
  - Countries (UK, USA, FR,GR, etc.)

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Asset-specific airworthiness

- Are all life-limited parts current
- Have all required inspections been completed
- Does the asset match its engineering definition
  - Are the proper parts installed
  - Is the software approved for this hardware configuration
- Are the weight and balance within acceptable limits
- Are any deviations/waivers been approved for this flight

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Management of the physical test configuration

- Ability to create the definition to the various configurations of a test article (tBOM)
- Take the as-built data(lacks hierarchal structure) and structures it based on tBOM structure
- Ability to compare tBOM (what it should look like) to as-tested (what it does it does look like)
  - Identify additions, differences and deletes – deviation management/approval
- Complete serial number component tracking (which test articles, how many cycles/hours(etc))
- Ensure compliance with time-limited parts
- Utilization accumulates on the component regardless of where used
- Complete lot tracking
- Visibility into physical component life limits

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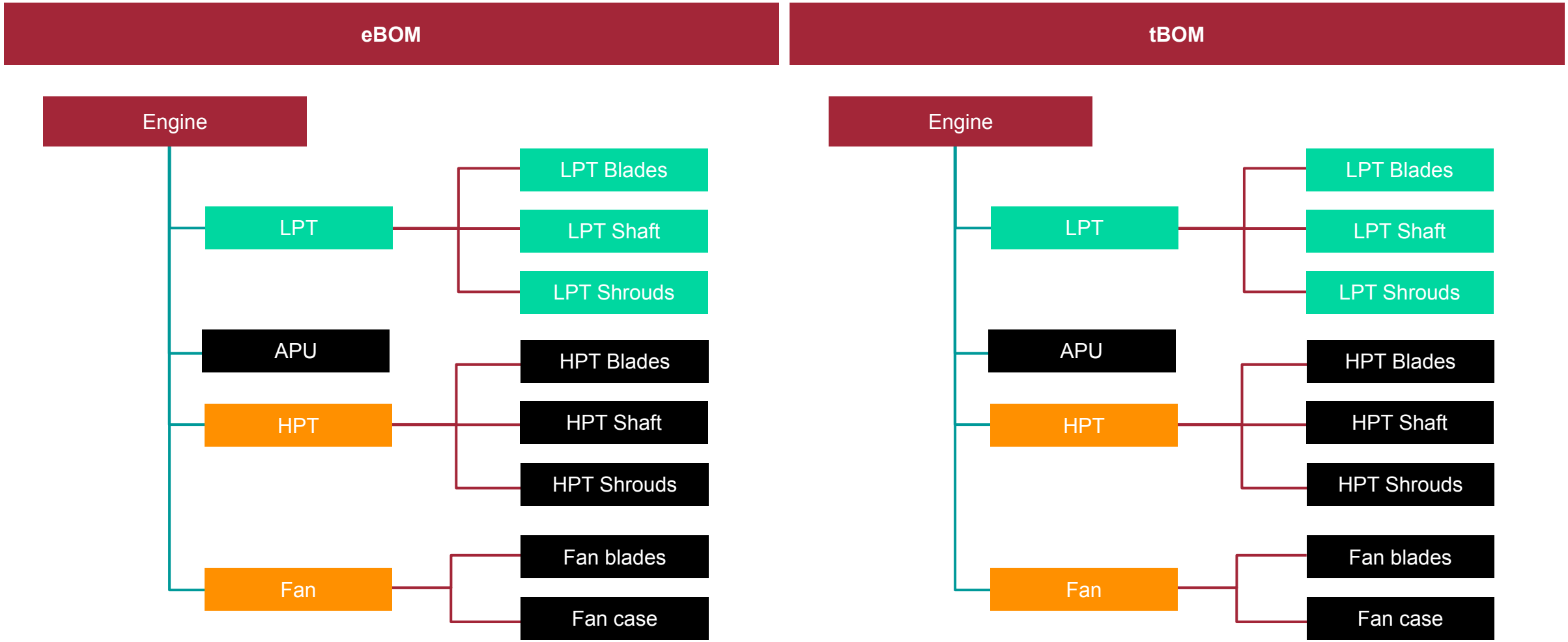
Fleet management – verification management



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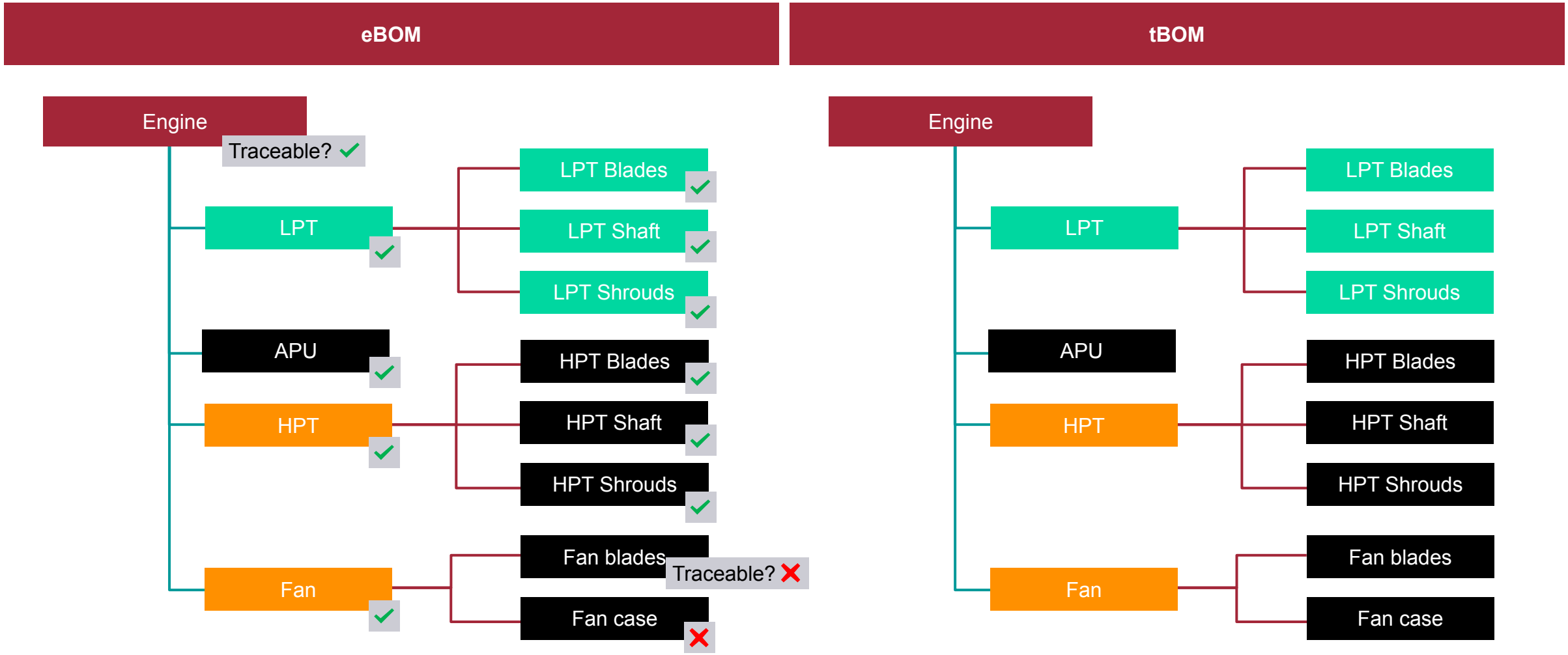

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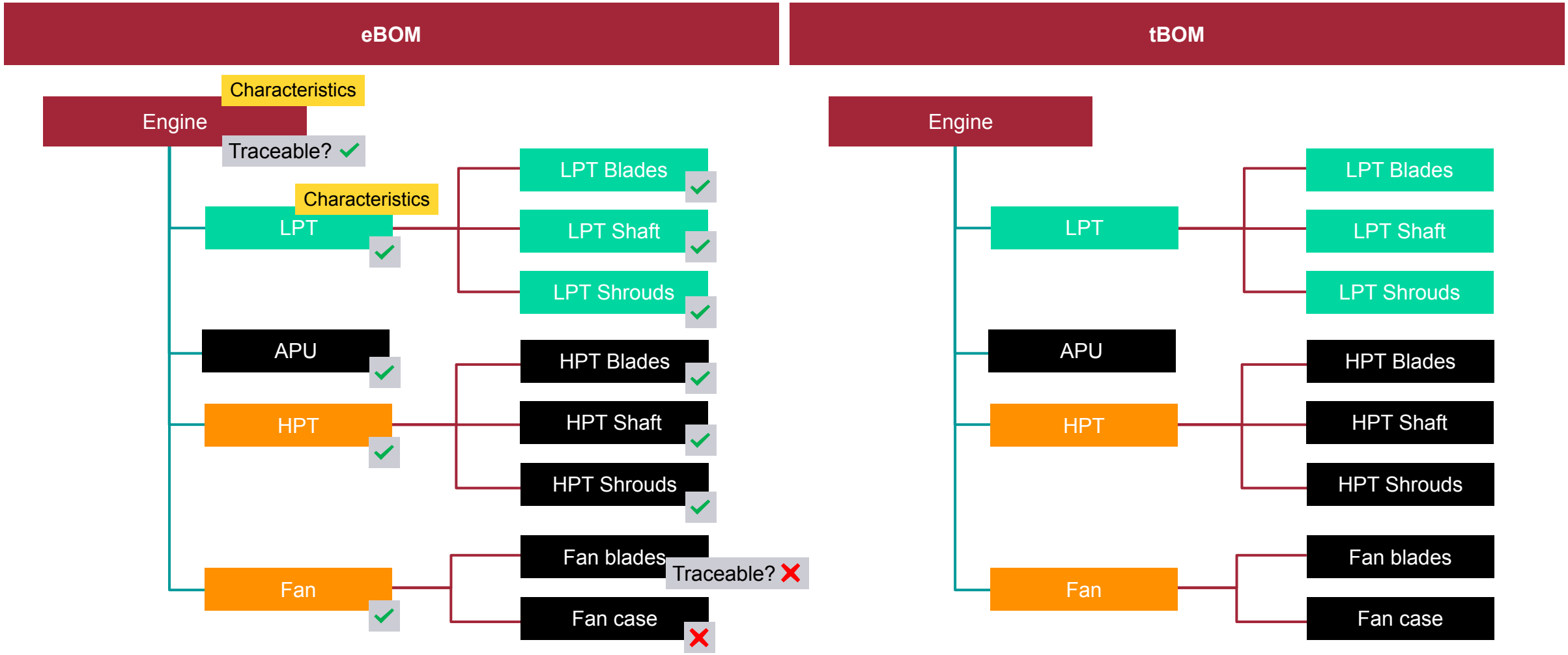

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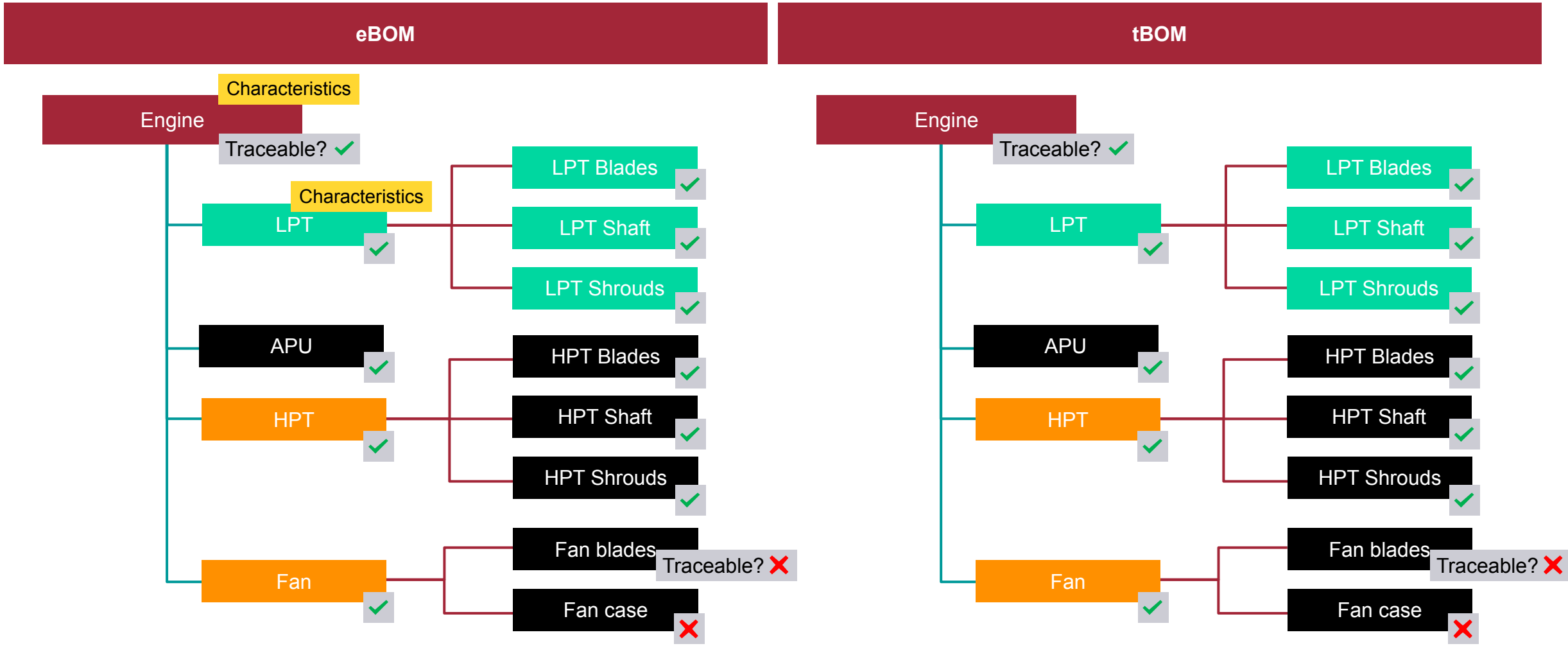

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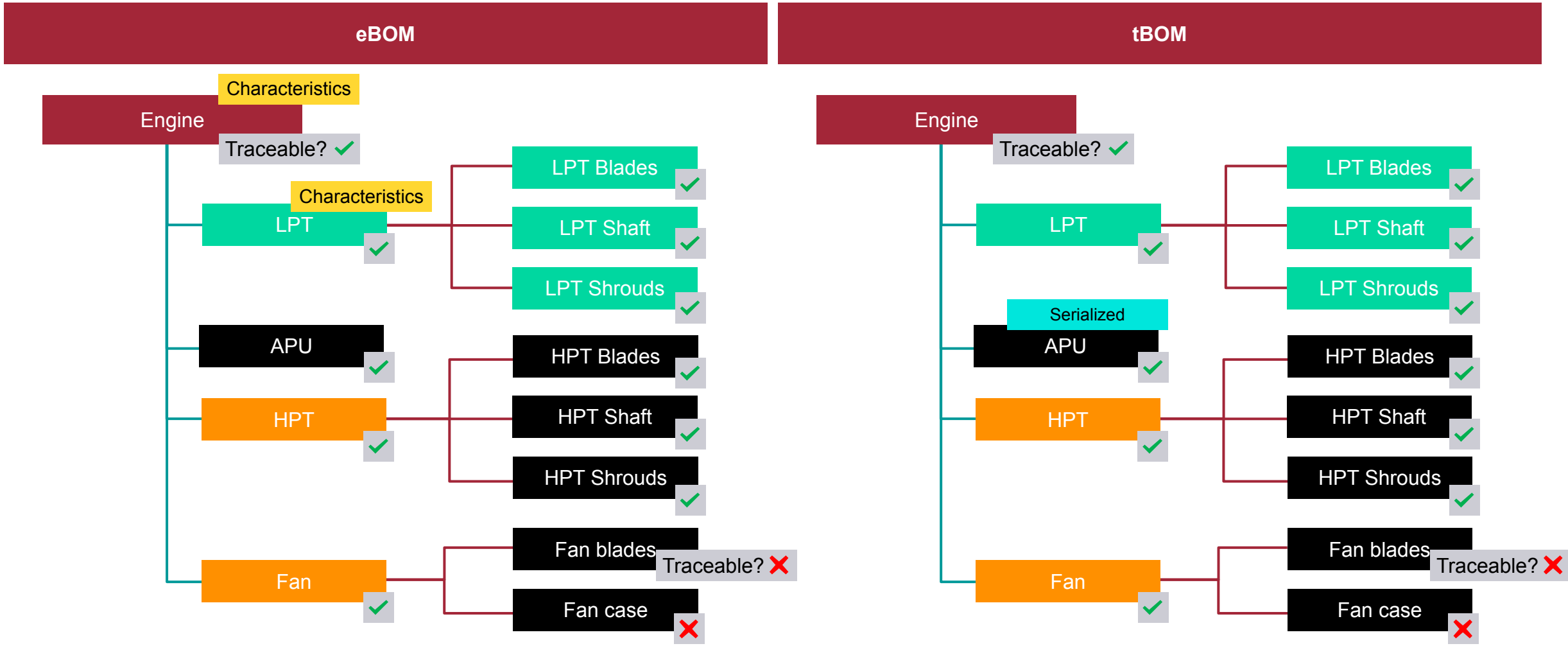

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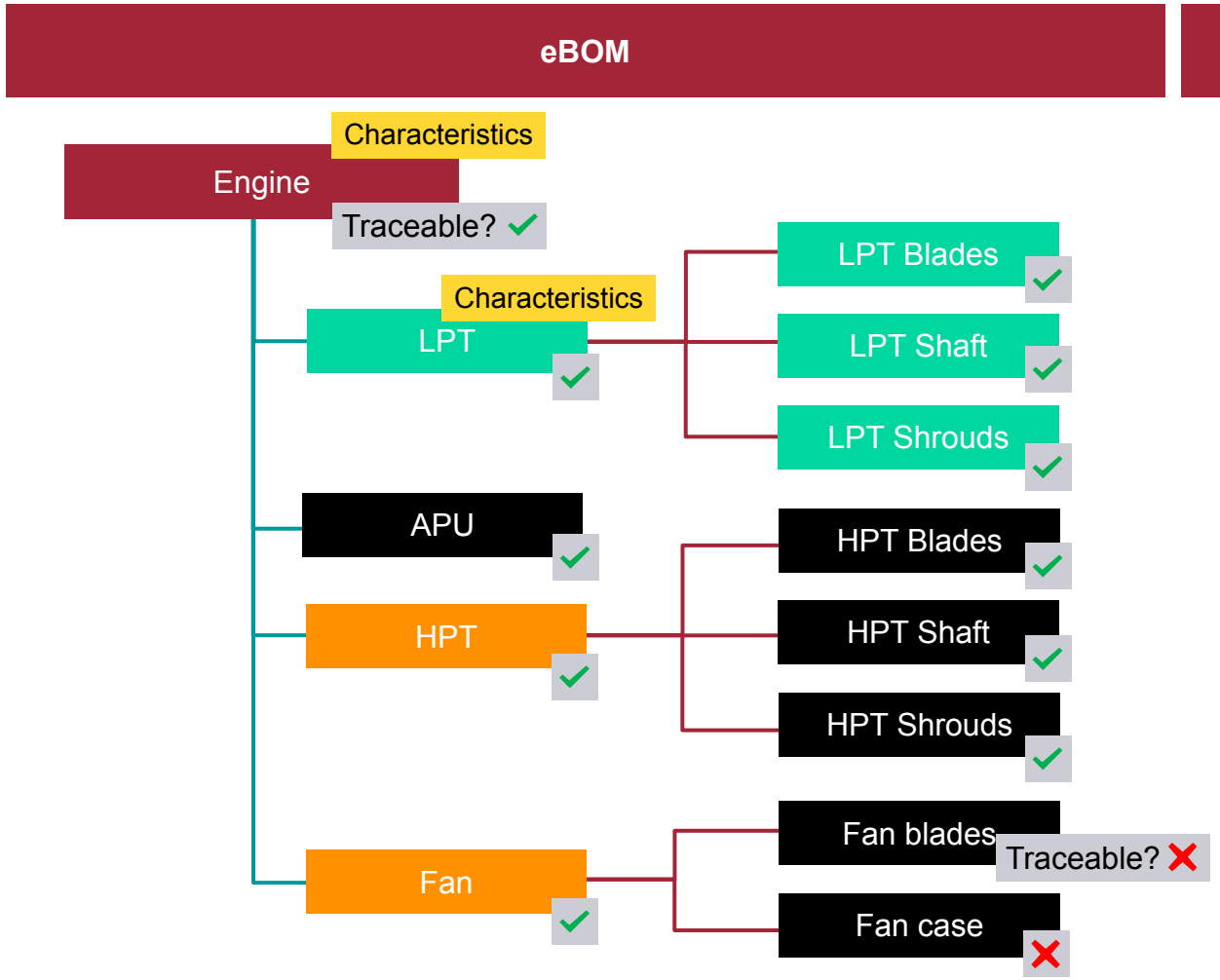

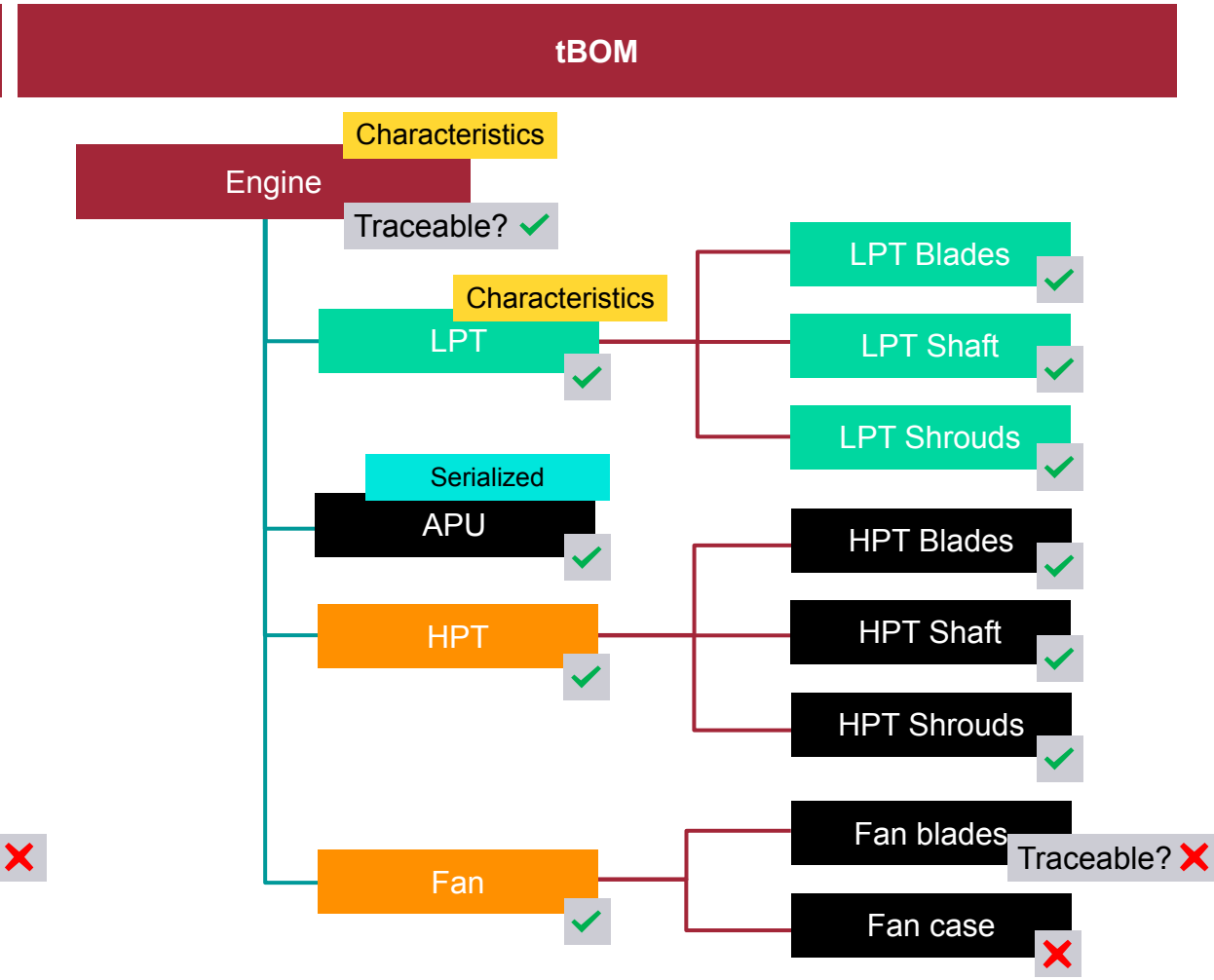

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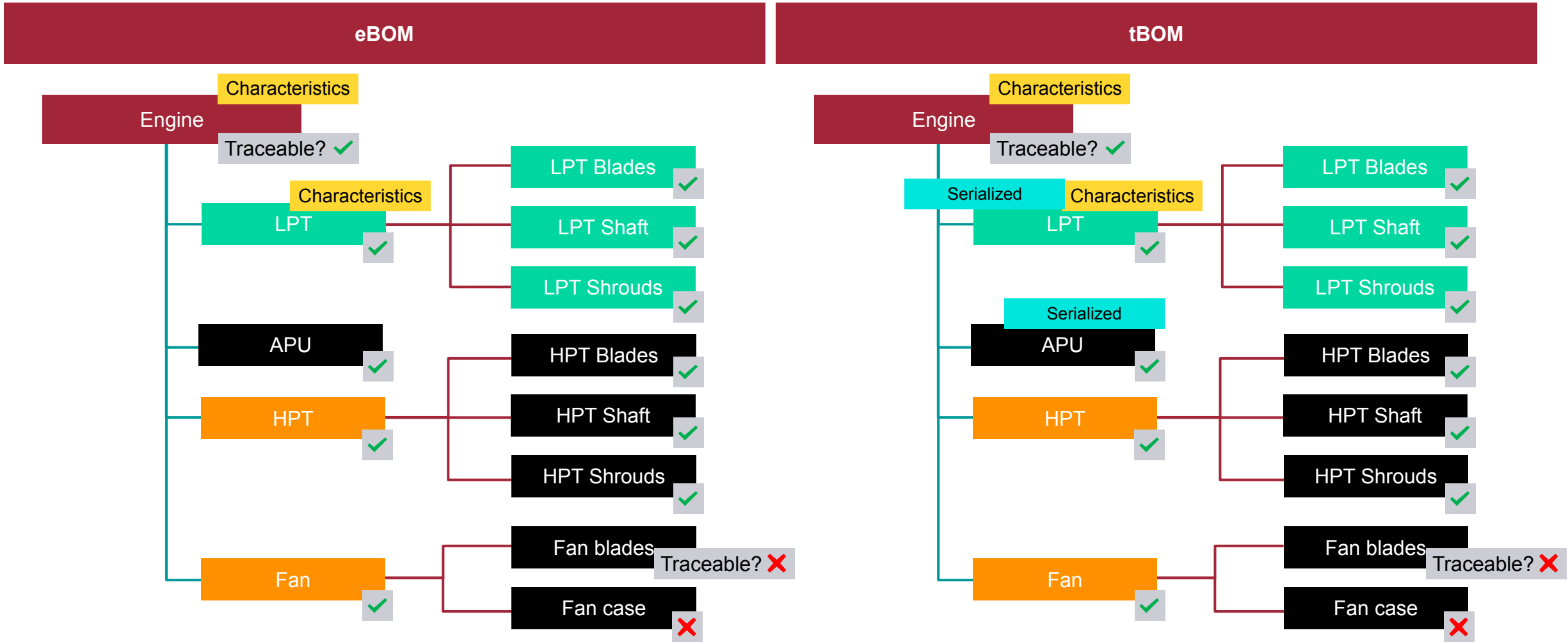

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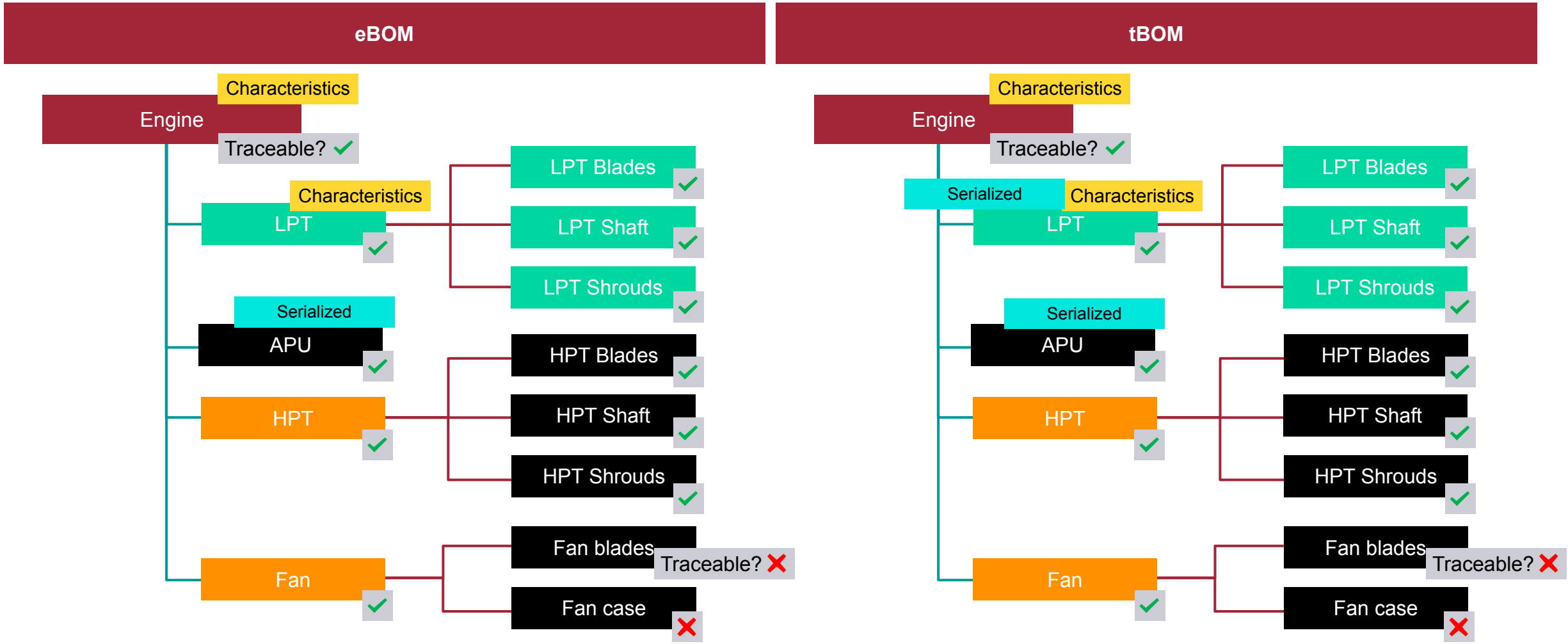

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Physical Structures

Accurate configuration details and complete test records for each build

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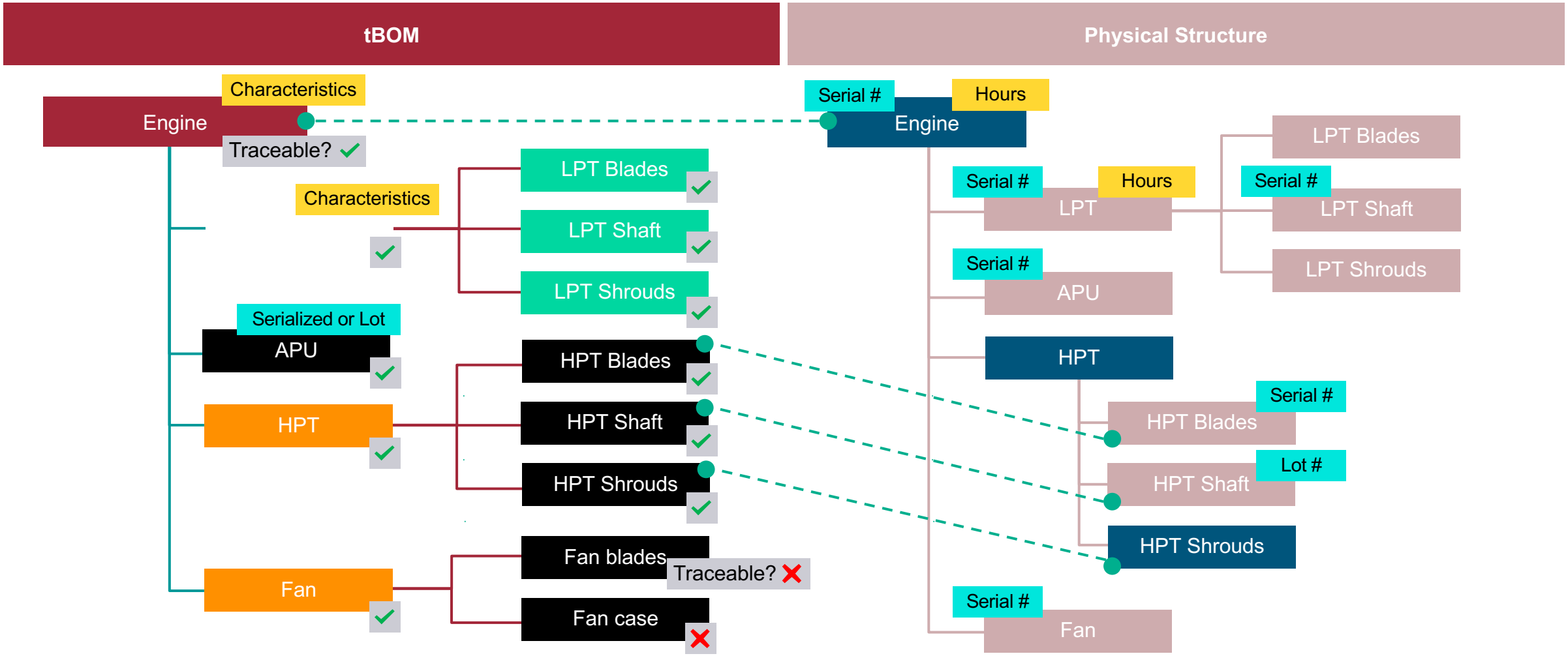

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Certification summary

- Certification solutions exist today to simplify and improve certification effort
  - Fully traceability to all certification artifacts
  - Fully traceability to the work breakdown structure
  - Ability to create programs from a common, constantly improved library
- Significant cost and schedule can be saved

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Thank you!

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