Host (on behalf of ASD):

ADS is the Premier Trade Organisation for companies in the UK Aerospace, Defence, Security and Space Sectors.

Customer Experiences with the Specifications

US Example

Ms. Dawn Meyer, Senior Logistics Manager, The Boeing Company
Mr. William Shook, Associate Technical Fellow, The Boeing Company
Mr. Paul Haslam, Principal S1000D & S-Series ILS Specifications Expert, O'Neil & Associates Inc

ILS Specification Day, London *October 17, 2019*

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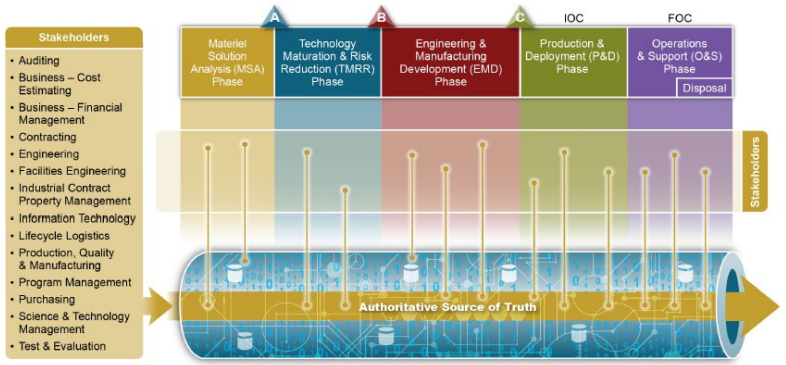
Environment: United States Military Specifications

- Policy and Strategy Initiatives
  - Federal Data Strategy:
    - Develops a coordinated and integrated approach to using data to deliver on mission
  - Federal Big Data Research and Development Strategy:
    - Increases the value of data through policies that promote sharing and management of data
  - Department of Defense (DoD): Defense Standardization Program
    - Establishes single unified standards program as required by US Law
    - Requires maximum standardization of items used by DoD programs
    - Requires standardization with NATO members and other countries
  - DoD Digital Engineering Strategy (OSD for Systems Engineering)
    - Transforms its engineering practices to digital engineering and incorporating technological innovations into an integrated, digital, model-based approach.
  - US Army Data Strategy
    - Creates a secure, integrated, standards-based environment that ensures uninterrupted global access and enables collaboration throughout all operational phases.
  - Many others….
- Commonality Between the Policies:
  - Increase interoperability
  - Improve military operational readiness
  - Maximize data reuse
  - Utilized throughout lifecycle



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US and the S-Series ILS Specs

- S-Series Specifications Support Goals of Many Current US Policies and Strategies
  - Interoperability:
    - Developed using US and European Product Support Best Practices and Lessons Learned
    - Adoption by NATO is under review
  - Improve military operational readiness:
    - Aligns with the US National Defense Strategy
    - Lowers cost of ILS documentation during development and decreases costs resulting from block-upgrades throughout the lifecycle
    - Lowers sustainment costs, improves integration, reduces data management effort, increases quality, improves data integrity
  - Maximize data reuse:
    - Integrates all the Product Support elements
    - Interfaces with Engineering data sources
    - Introduces In-Service Feedback which supports Data Analytics
  - Utilized throughout lifecycle:
    - Applies to new, future, and legacy programs
    - Begins at Solution Analysis and applies until Product disposal

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US and the S-Series ILS Specs

- Challenges
  - S1000D expanding its usage on US programs, but no other S-series specs
    - ~22 US programs use S1000D
  - Reaching decision makers of the various agencies implementing the current strategies to understand capability of the S-Series ILS specs
  - Representation of US companies on the S-Series ILS Spec Steering Committees
  - Understanding how to contract for deliverables US DoD utilizes to deploy their Products

Program	Company
Advanced Arresting Gear (AAG)	General Atomics
AEWC	Boeing
AH-6I	Boeing
AWACS	Boeing
C-17	Boeing
E2D & E2C	Northop Grumman
Electromagnetic Aircraft Launch System(EMALS)	US Navy
Electronic Consolidated Automated Support System (eCASS)	US Navy
EP-3	Lockheed
F-35 Joint Strike Fighter	Lockheed Martin
Fire Scout	Northrop Grumman
H-53K	Sikorski
Joint Precision Approach and Landing System (JPALS)	Raytheon
KC46	Boeing
Mission Enhanced Little Bird (MELB)	Boeing
MQ-4C Triton	Northrop Grumman
Next Generation Jammer (NGJ)	Raytheon
P8	US Navy
RQ-21A Blackjack Small Tactical Unmanned Air System (STUAS)	Insitu
T-X	Boeing/Saab
VH-3D	Sikorski
VH-60N	Sikorski

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U.S. Navy Acquisition Readiness Training Transformation (ARTT) Project

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US Example

- U.S. Navy Acquisition Readiness Training Transformation (ARTT)
  - **Using Industry Standards to Derive Tech Data and Training from Product Support Analysis**
  - **Project Lead Wayne Gafford**
  - **S3000L expert Leif Gylstrom**
  - **S6000T expert William Shook**
  - **S1000D expert Paul Haslum**

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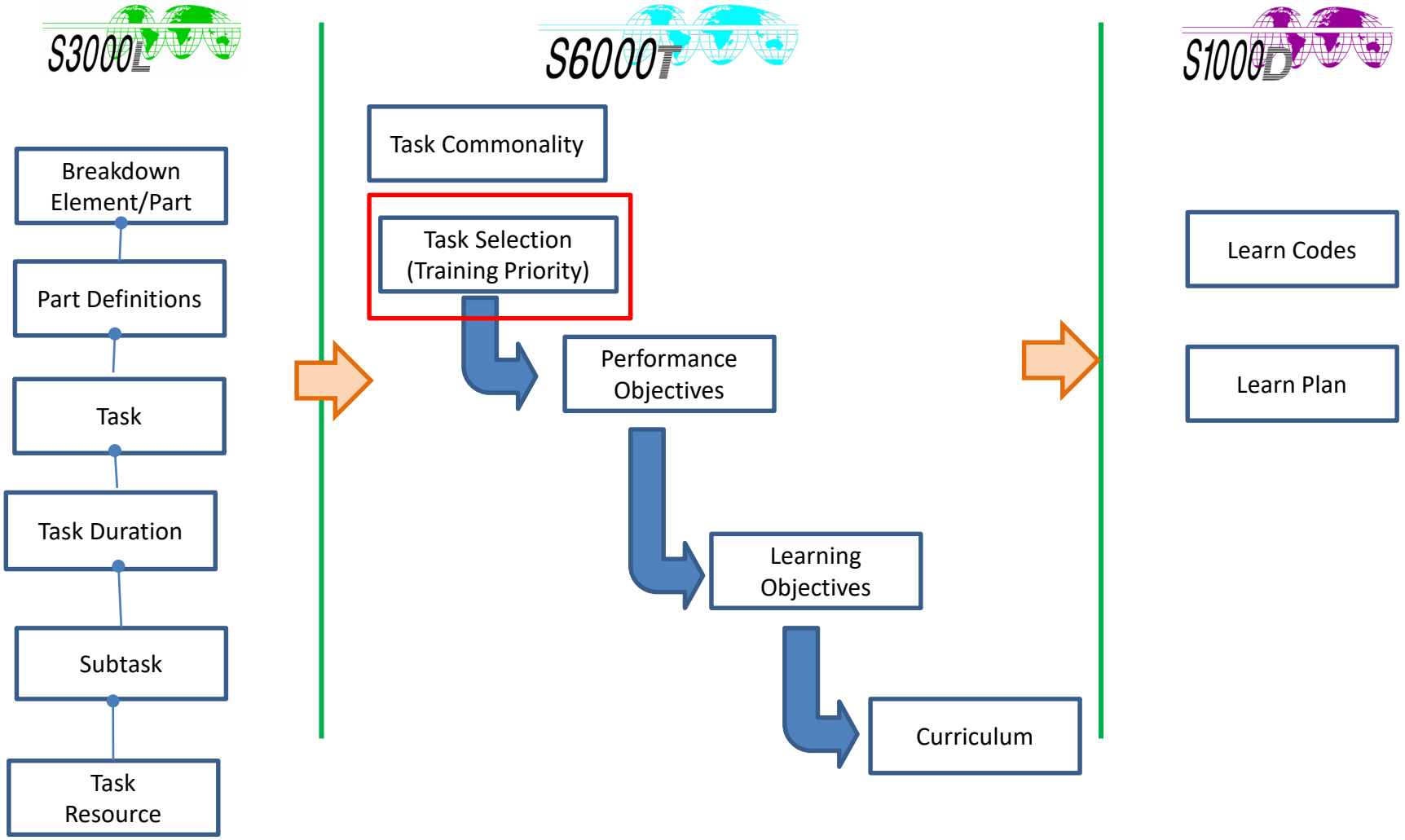
Reusing Specification Data to reduce cost



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Training Analysis

- Task Selection

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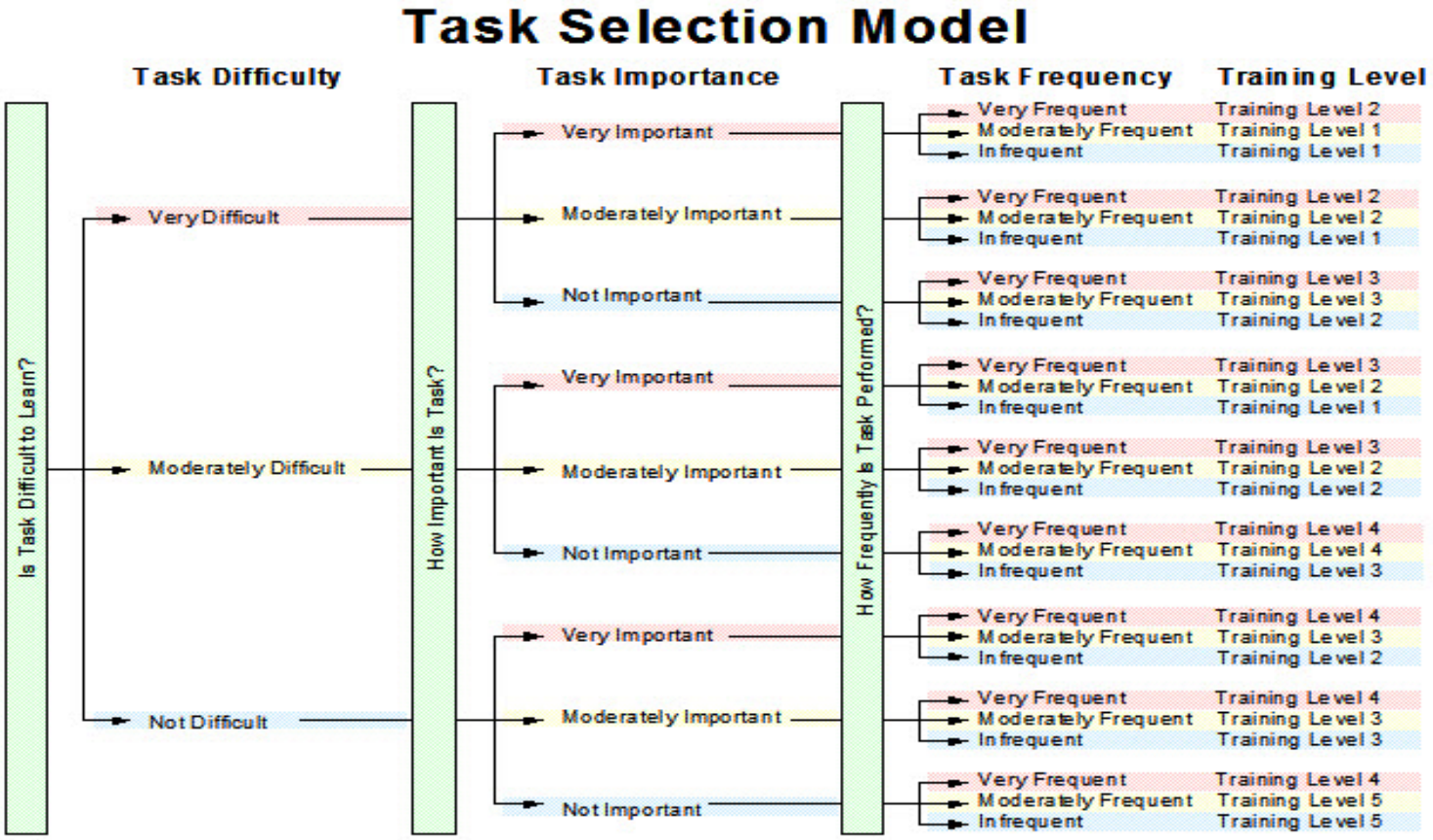
S6000T Task Selection Model



TRAINING LEVELS
1 = Very High Priority. Very high standards required to ensure skill retained without frequent practice on the job.
2 = High Training Priority. Standards up to the level required to do the task completely without further training or practice.
3 = Moderate Training Priority. Standards below those required to do the job efficiently and further training or practice required.
4 = Low Priority. Standards well below competent task performance. Formal training merely provides the basis for subsequent on-the-job training and practice.
5 = Formal Training Not Required. Task can be picked-up easily on-the-job.

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Training Prioritization Decisions

- Task Difficulty
  - Task difficulty is a classification that identifies the complexity of a task from a human performance perspective.
  - Task difficulty can be derived from e.g. the following task aspects:
    - Personal safety
    - Time it takes to perform the task
    - Need for human interaction
    - Conditions under which the task is to be performed.

  Note: Difficulty to train applied during Learning Objective development
- Task Importance
  - Task importance is a classification that identifies possible affects that the performance of the task can have with respect to cost (damage) and availability for the end item
  - Task importance can be derived from e.g. the following aspects:
    - Mission (operability) impact
    - Product integrity impact
    - Function essentiality
- Task (Performance) Frequency
  - Task frequency is a classification that identifies how often a task is performed from a decay of skill perspective
  - Task performance frequency is based on how many times a task (including similar tasks) is performed under a given time period (usually defined per year)

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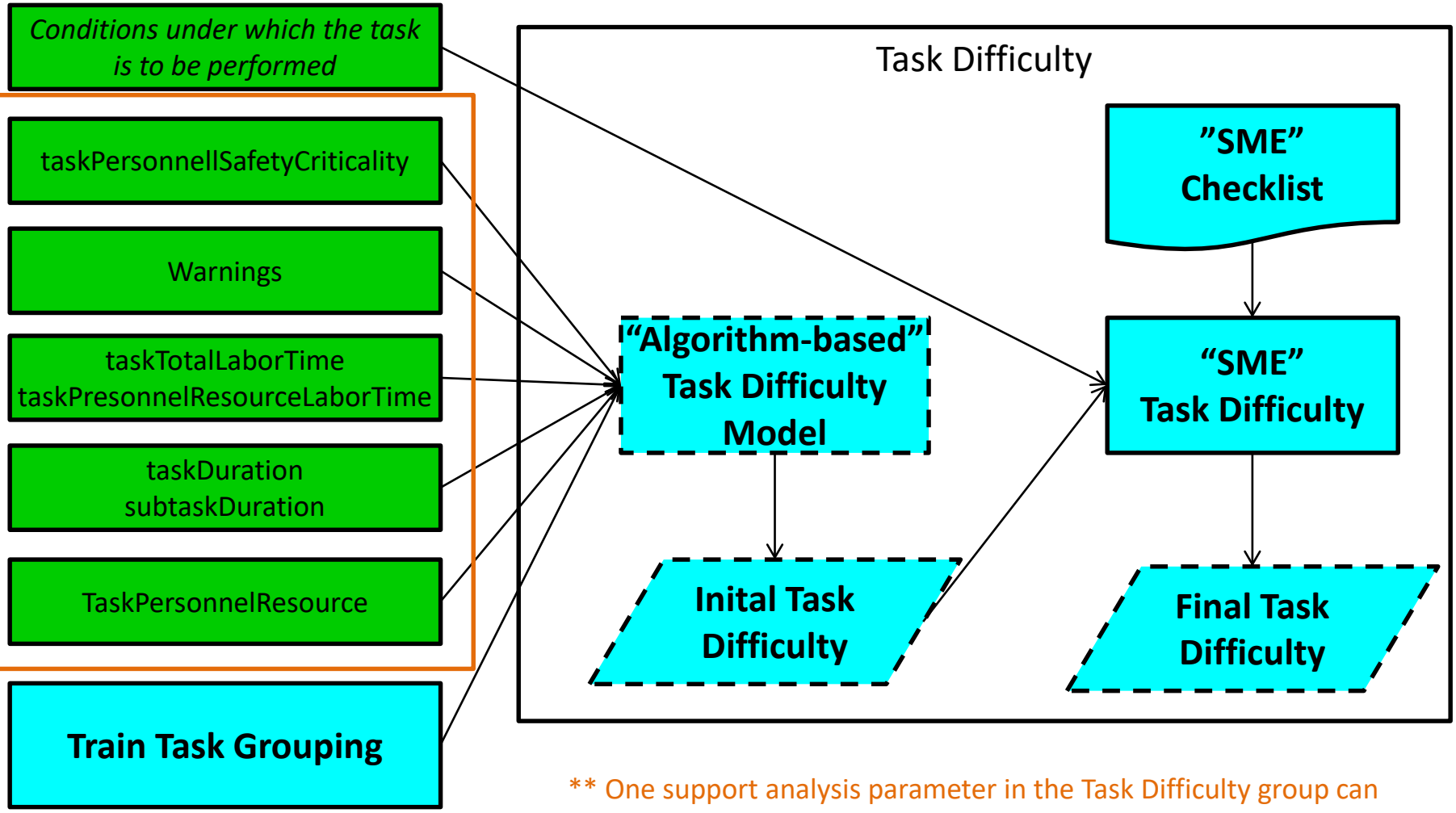
Task Selection – Task Difficulty (S3000L)



** One support analysis parameter in the Task Difficulty group can force the "very, moderate or not" determination part of an algorithm

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S3000L Definitions

- taskPersonnellSafetyCriticality
  - taskPersonnelSafteyCriticality is a classification that identifies the most serious health aspects that the performance of the task can pose on personnel performing the task
- taskTotalLaborTime
  - taskTotalLabourTime is the total time expended within a task. Includes the labor time for all required personnel resources.
- taskDuration
  - taskDuration is the average time expended, regardless of the number of personnel working simultaneously, required for the performance of a task, scheduled or unscheduled.

    Note: taskDuration does not include time spent awaiting spares, support equipment, facilities or personnel (logistics delay time).
  - Warning (S1000D)
    - Warnings are used to alert the user that possible hazards are associated with the materials/processes/procedures/limits. These can cause death or injury in any form if the instructions in the operational or procedural task are not followed precisely.

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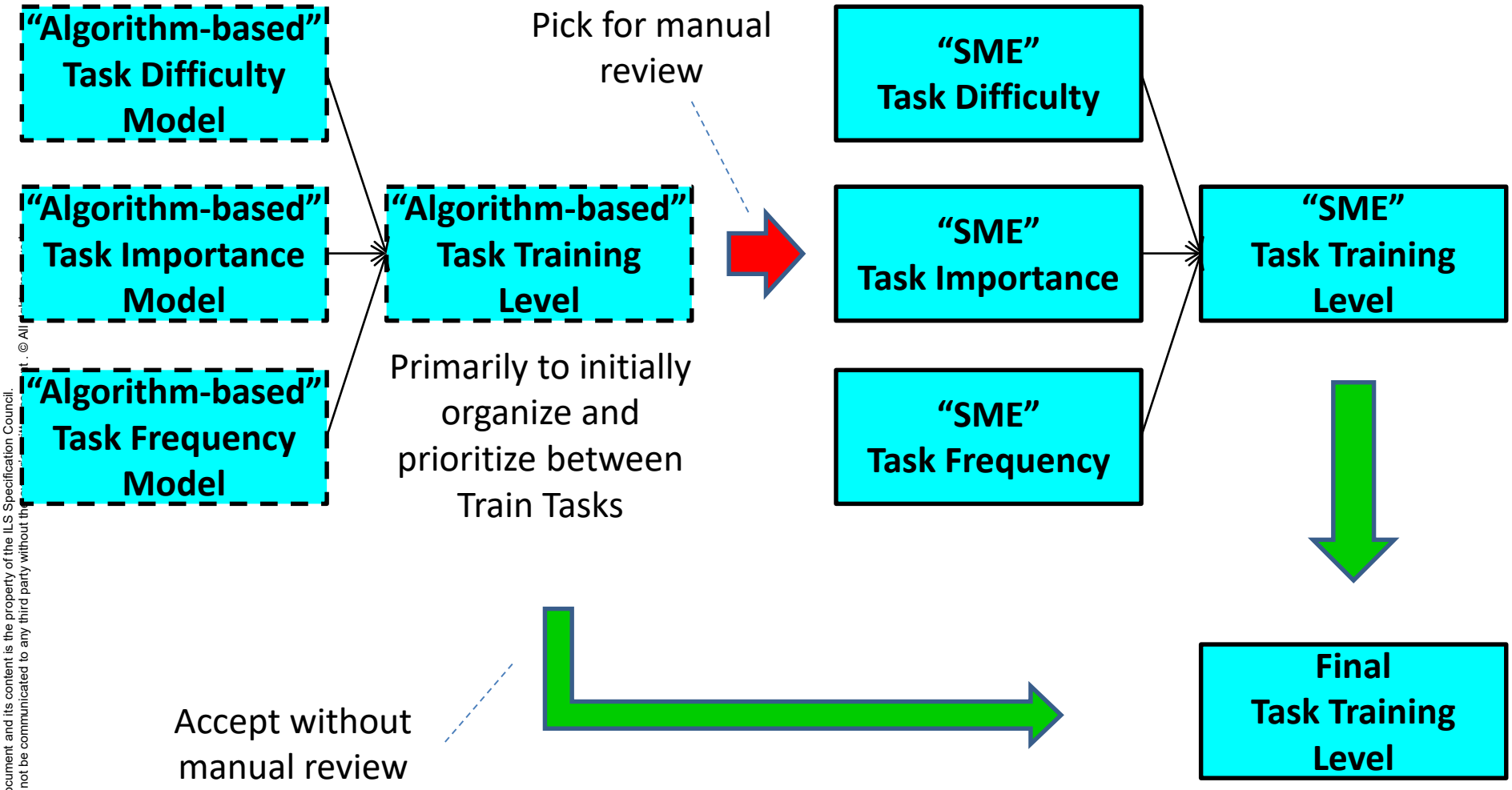
Task Selection Determining – Determine Training Level



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Training and Technical Data Content

- Learning Schema

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S6000T to S1000D

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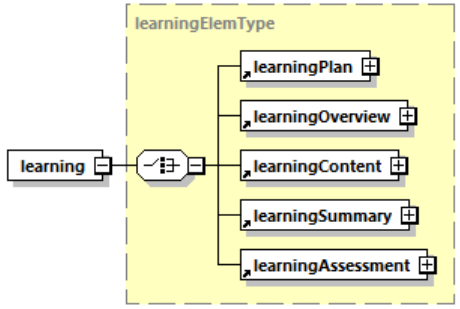
Training and Technical Data Content – What S1000D has

- S1000D Learning Schema - 5 branches
  - Learn Plan
    - Project Performance Analysis
    - Cause Analysis
    - Intervention Definition
    - Learning Objective (From S6000T: Terminal Learning Objective)
    - Learning Objective Items (From S6000T: Learning Objective(s) – 1 for each topic)
    - Intervention Implementation
    - Performance Evaluation
  - Overview
  - Content
  - Summary
  - Assessment



- S1000D Shareable Content Object (SCO Content) Schema
- S1000D SCORM Content Package Module (SCPM) Schema

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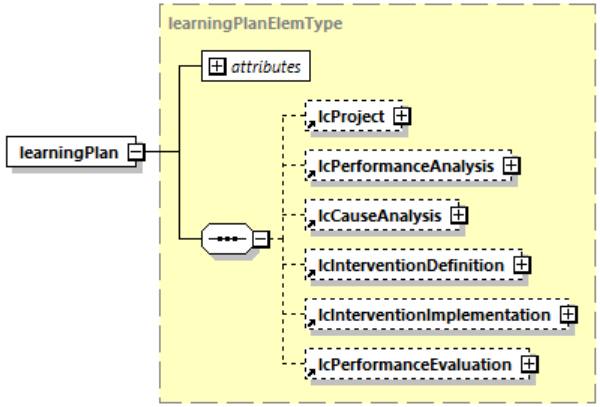
Training and Technical Data Content – S1000D Learning Schema

- 6 sub-branches
  - Project – Information about the Project (target auc title/description, course identifier, etc)
  - Performance Analysis
  - Cause Analysis
  - Intervention Definition
    - Learning Objective (From S6000T: Terminal Learning Objective)
      - Learning Objective Items (From S6000T: Learning Objective(s) – 1 for each topic)
  - Intervention Implementation
  - Performance Evaluation



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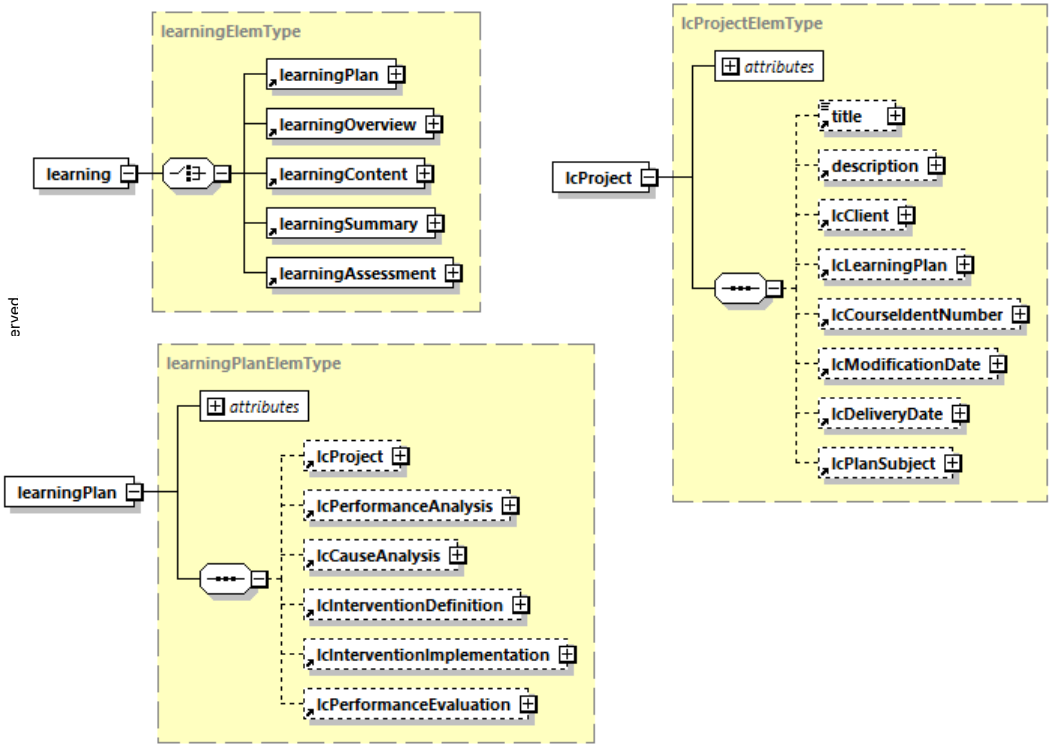
Training and Technical Data Content – S1000D Learn Plan Data Module



Project:
Administrative information about the learning plan structure being developed from a performance analysis or training needs analysis

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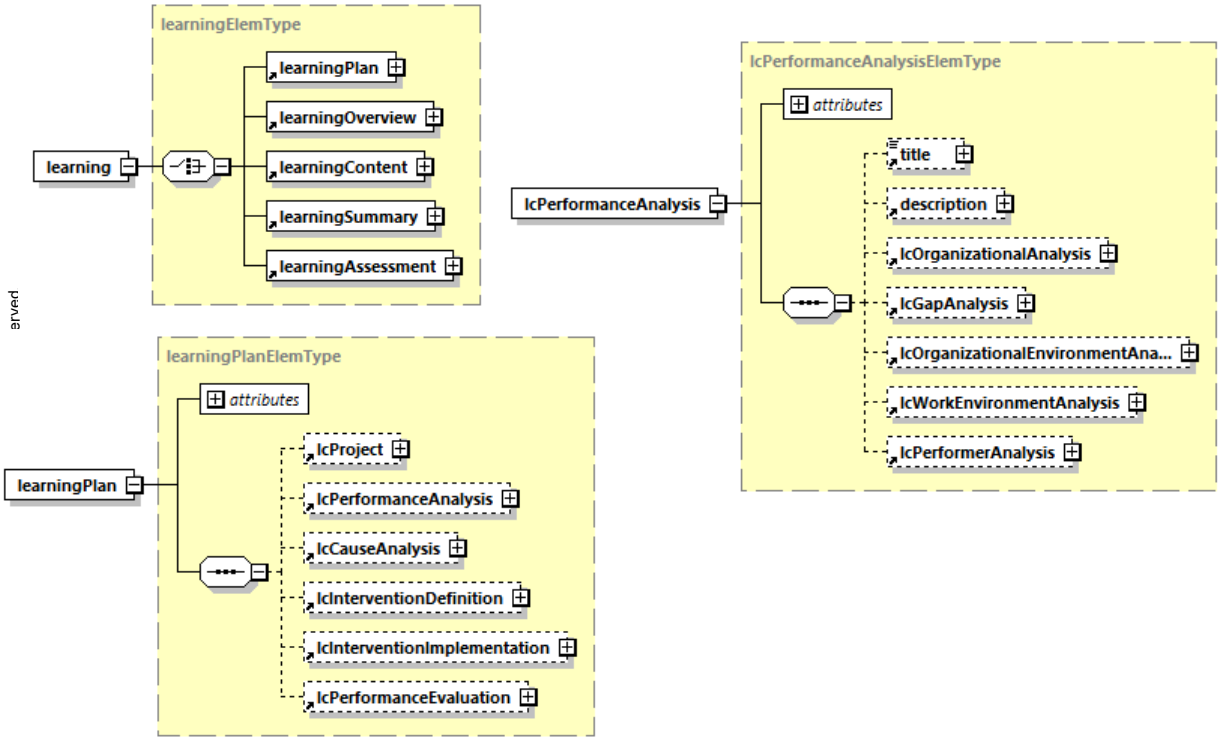
Training and Technical Data Content – S1000D Learn Plan Data Module



Performance Analysis:
Information and requirements resulting from an analysis of the affected human performance system or training needs of the product users.

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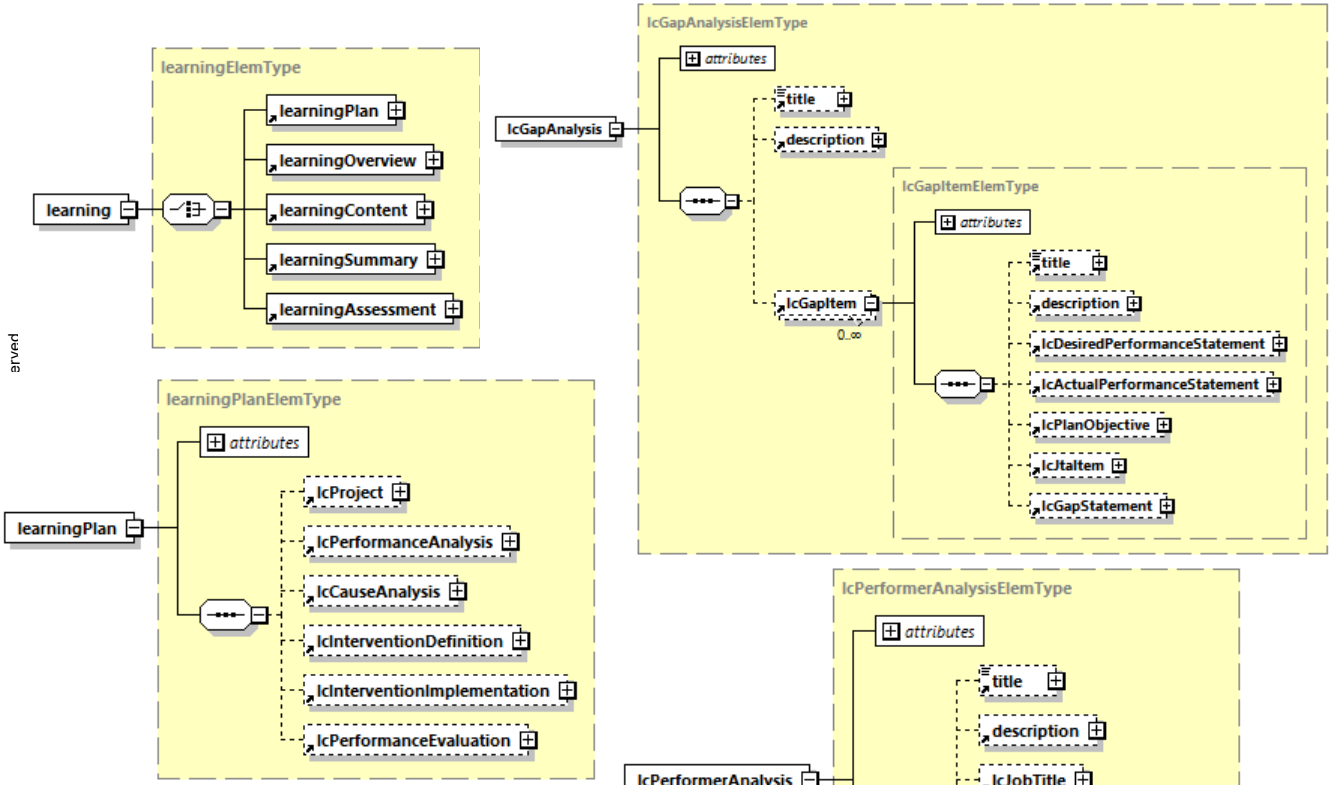
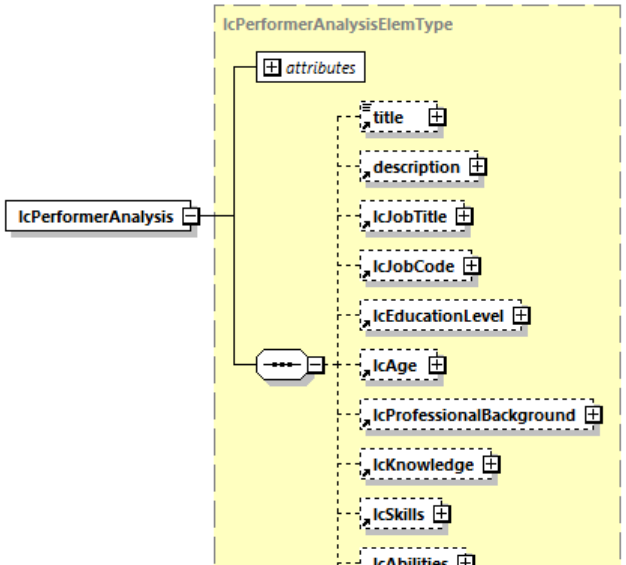
Training and Technical Data Content – S1000D Learn Plan Data Module





Gap Analysis:
Contains the gap analysis information, which defines the delta between an organization's desired end state, as stated in its goal and objectives, and its current state

Performer Analysis:
information regarding factors within an organization's workforce that can influence its abilities to meet its vision, mission, goals, and objectives.

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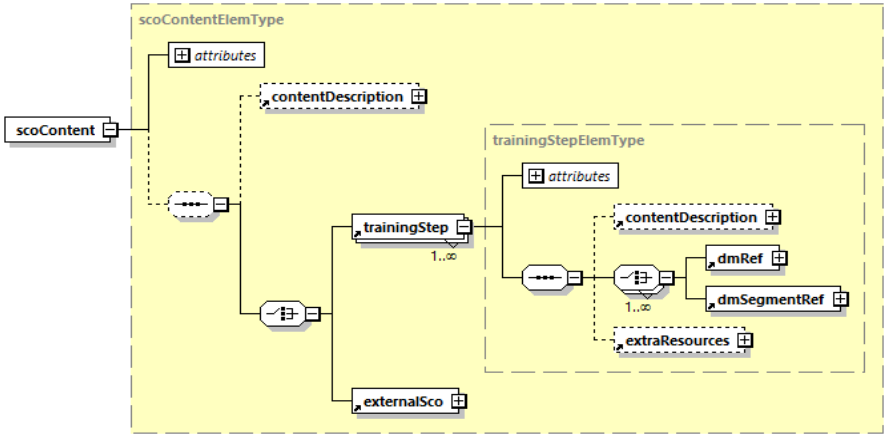
Training and Technical Data Content – Shareable Content Object (SCO)

- In S1000D, a SCO Data Module is a list containing:
  - References to other Data Modules
    - SCO Data Modules
    - Learning Data Module(s)
    - Data Modules using other S1000D Schemas
  - Or a reference to a Publication Module
    - Could be the technical manual



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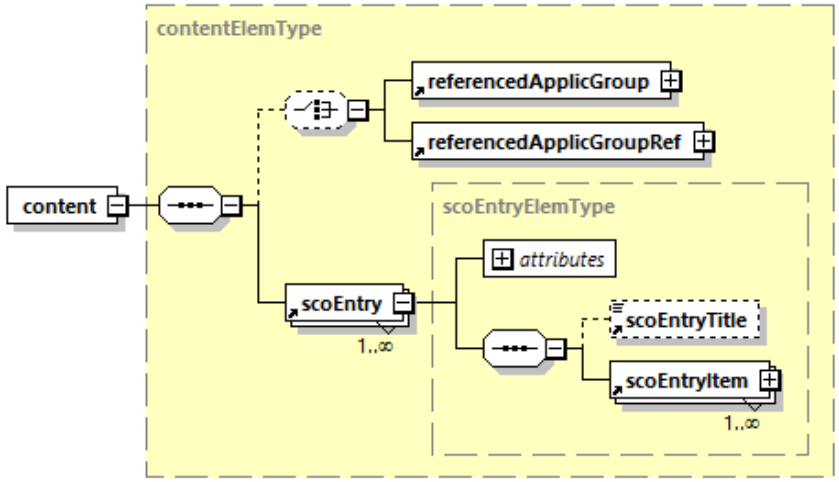
Training and Technical Data Content – SCORM Content Package Module (SCPM)

- An SCPM is a list of data modules
- Could be:
  - SCO Data Modules
  - Data modules using the Learning Schema
    - Branch A
      - Objectives
      - Gap Analyses
    - Branches B, C, D
      - Overview
      - Course Content
      - Summary
    - Branch E
      - Assessment
  - Data Modules using other S1000D Schemas



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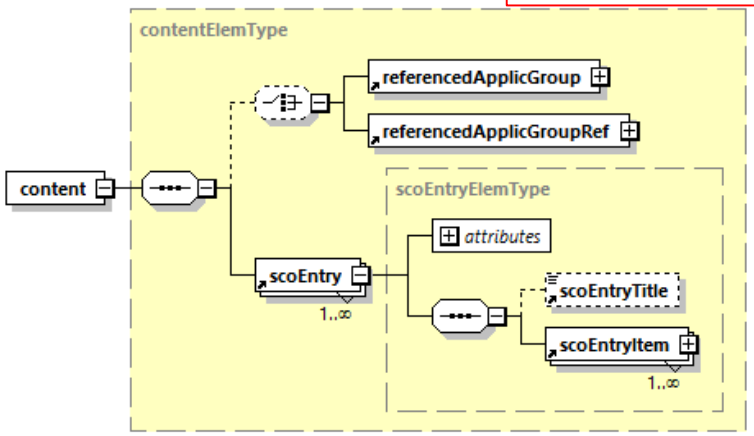
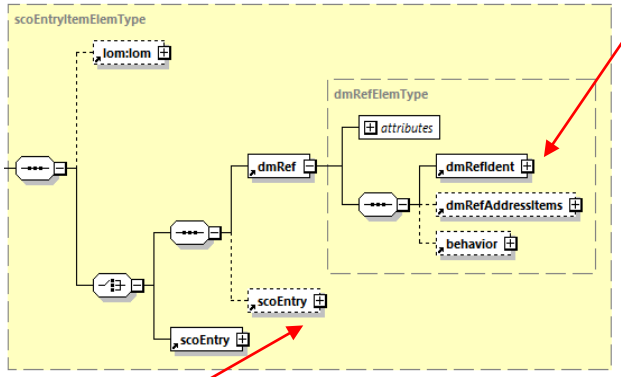
Training and Technical Data Content –SCPMs, SCOs, TLO & ELOs

Course SCORM Content Package Module

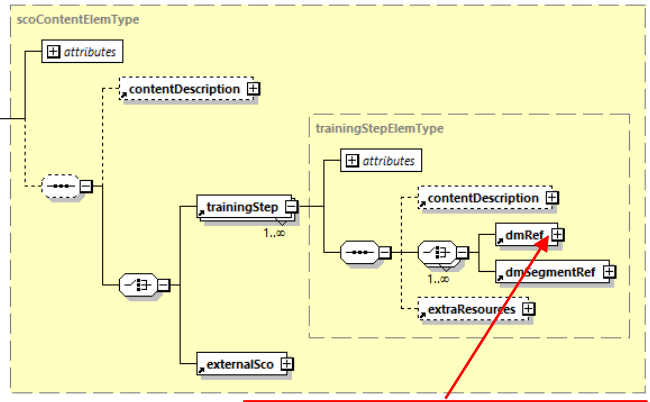


Terminal Learning Objective

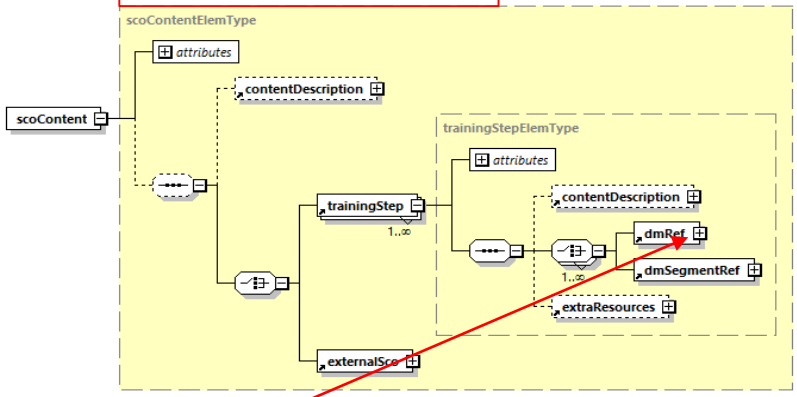


SCOs (1 for each Module)

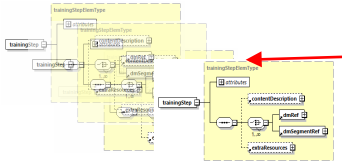
Lesson SCO Data Module



Module SCO Data Module



Reference to a Lesson SCO



Enabling Learning Objective

Overview
Content (Discussion Points)
Summary
Assessment

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Training and Technical Data Content –ARTT Lesson Plan Structure in S1000D

- Course
  - Terminal Learning Objective
  - Modules
    - Lessons
      - Enabling Objective
      - Overview
      - Content
        - » Discussion Points
          - Subject
          - Instructor Activity
      - Summary
      - Assessment

- SCPM
  - Data Module
  - SCOs
    - SCOs
      - Learn Plan Data Modules (Branch A)
      - Overview Data Module
      - Content Data Modules
        - Links to Courseware
        - Links to Technical Manuals
      - Summary Data Module
      - Assessment Data Module(s)

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Training and Technical Data Content – What would happen next

- The top level SCPM together with:
  - SCPMs for each Section
  - SCOs for each Topic
  - Terminal Learning Objective DM
  - Learning Objective DMs (one for each Topic)
  - Overview DMs (one for each Topic)
  - Content DMs (multiple for each Topic)
  - Summary DMs (one for each Topic)
  - Assessment DMs (none, one or multiple for each Topic)
  - Graphics/Multimedia (as directed by S6000T and Course designers)
- When zipped, is a SCORM Conformant Package
- Passed to Course Designers/Developers

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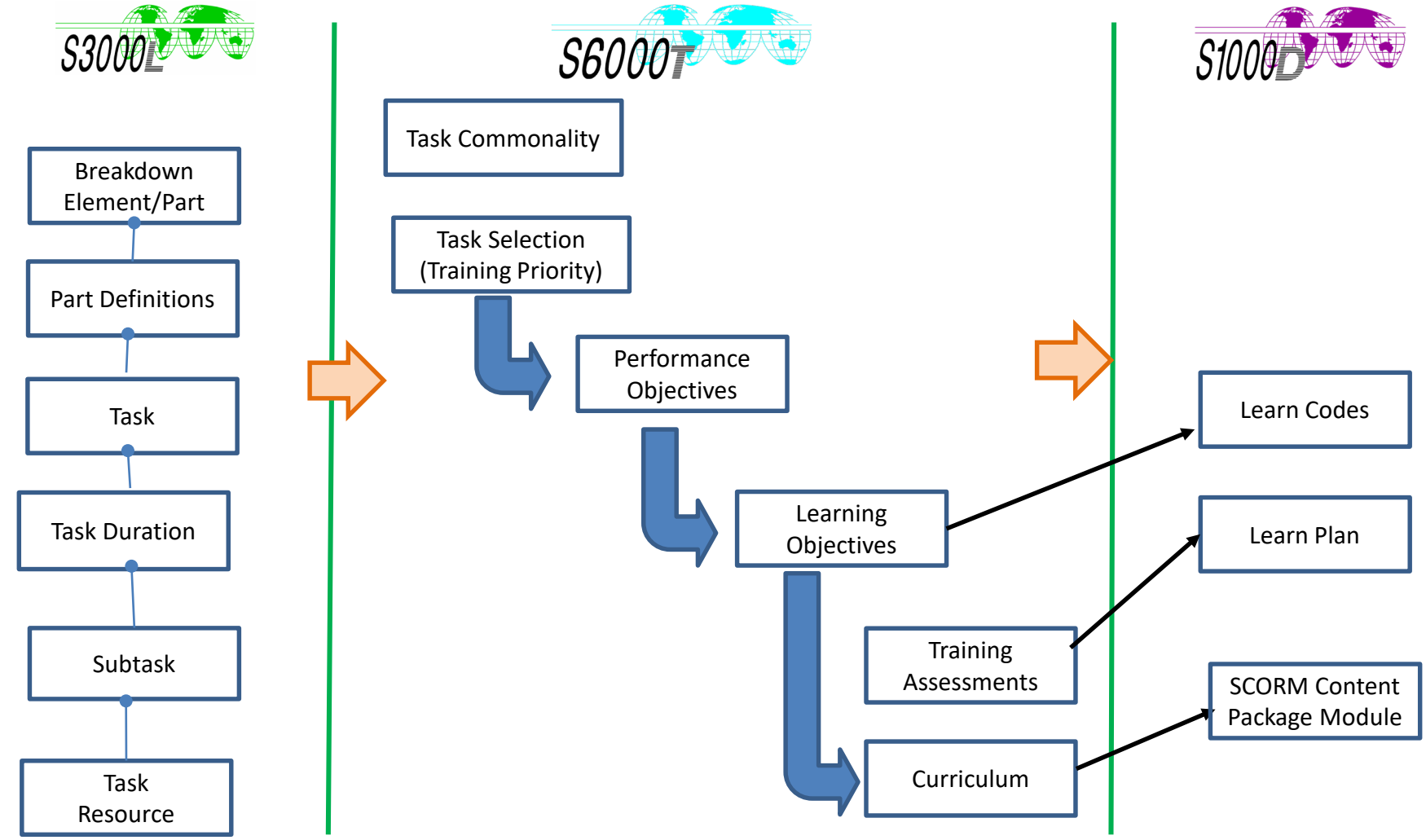
Reusing Specification Data to reduce cost



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Thank you

for your attention!

Questions?

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phaslam@oneil.com

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