INDUSTRIE - TECHNIK

IETD to XR

Automating ASD/AIA Documentation Processing

The adoption of newer media technologies in learning experiences has made great leaps in the last decade. We see the need to support these efforts with research in matters of generalization and automated reuse of interactive electronic technical documentation (IETD). Especially documentation data adhering to the ASD/AIA (often called S-Series) specification is suited for these emerging matters due to its inherent consistent and consequent formalization.

Creating automated adoption possibilities for this widely used and maintained data can increase the efficiency and usefulness of smart maintenance and training in the applicant fields, such as aerospace and defence.

This proposal aims at an in-depth look specifically of procedural document types and their formalizations, however, insights are not limited to these.

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Adequate Data Quality

In terms of automated processing, any documentation data needs to fulfil three requirements:

(1) An easy exchangeable and processable data format, *here with sgml/xml*

(2) A specified and documented data structure, *here with xml schemas*

(3) An adequate data quality adhering to the specification

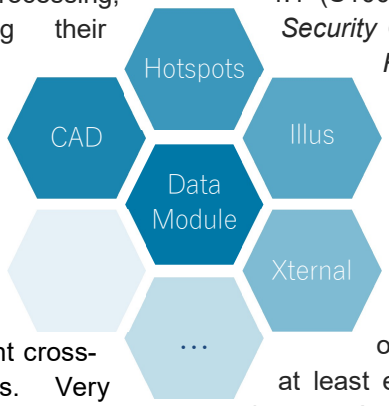
We view the data quality as adequate, if the presented data fulfils:

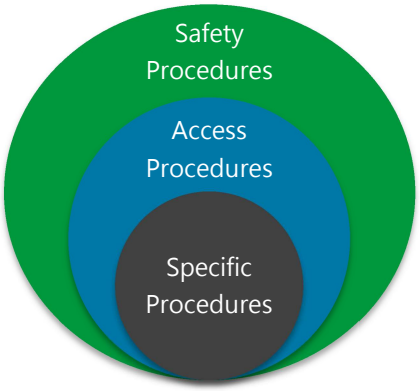
- ✔ Completeness: 90% of needed data is available
- ✔ Validity: data modules conform with the specification schemas
- ✔ Consistency: any deviation from the specification is intentional (valid) and consistently represented
- ✔ Timeliness: the given data modules are up-to-date for their intended use

Foremost these requirements adhere to the textual data modules, the basis of any documentation. Additionally though, these requirements can also be applied to considered additional information, such as technical Illustrations, external media like videos or photographs, and even CAD model data. Depending on the use case these also are considered in the documentation processing, especially by calling their references.

Reference Management

The discussed IETD offers chances to great analysis insights with the inherent cross-referencing hierarchies. Very worth of mentioning in this context are requirement references linking data modules according to timeliness and dependency. Procedure-wise this frequently





divides tasks into safety establishment, machine part access (and closing) and the final, specific maintenance procedure. All but the latter are often referenced multiple times which makes them excellent training use cases. An excerpt of noteworthy reference elements:

DMRefs (other data module)
HotspotRefs (to illustration)
CSN(Catalogue Sequence No)
IPP (Initial Provis. Project No)
ISN (Item Sequence No)
NSN (NATO Stock No)
IdentNo

Material Management

The documentation provides several starting points to support material management.
Exemplarily, references in material matters occur in procedure equipment and in the spare parts catalogue and may be used to manage material stock and location for user.

Security Management

Exemplarily, documentation in issue 4.1 (S1000D crew) may include *Security Classification* and *Data Restriction* elements, including distribution regulations and restriction conditions. Other procedure modules include a required *skill level* element for the operator. Any issue will at least exhibit a *security class* element. Access to documentation items can therefore be regulated using a digital fingerprint of the user, perhaps from an employee database.