



# *Info*Trust

Group

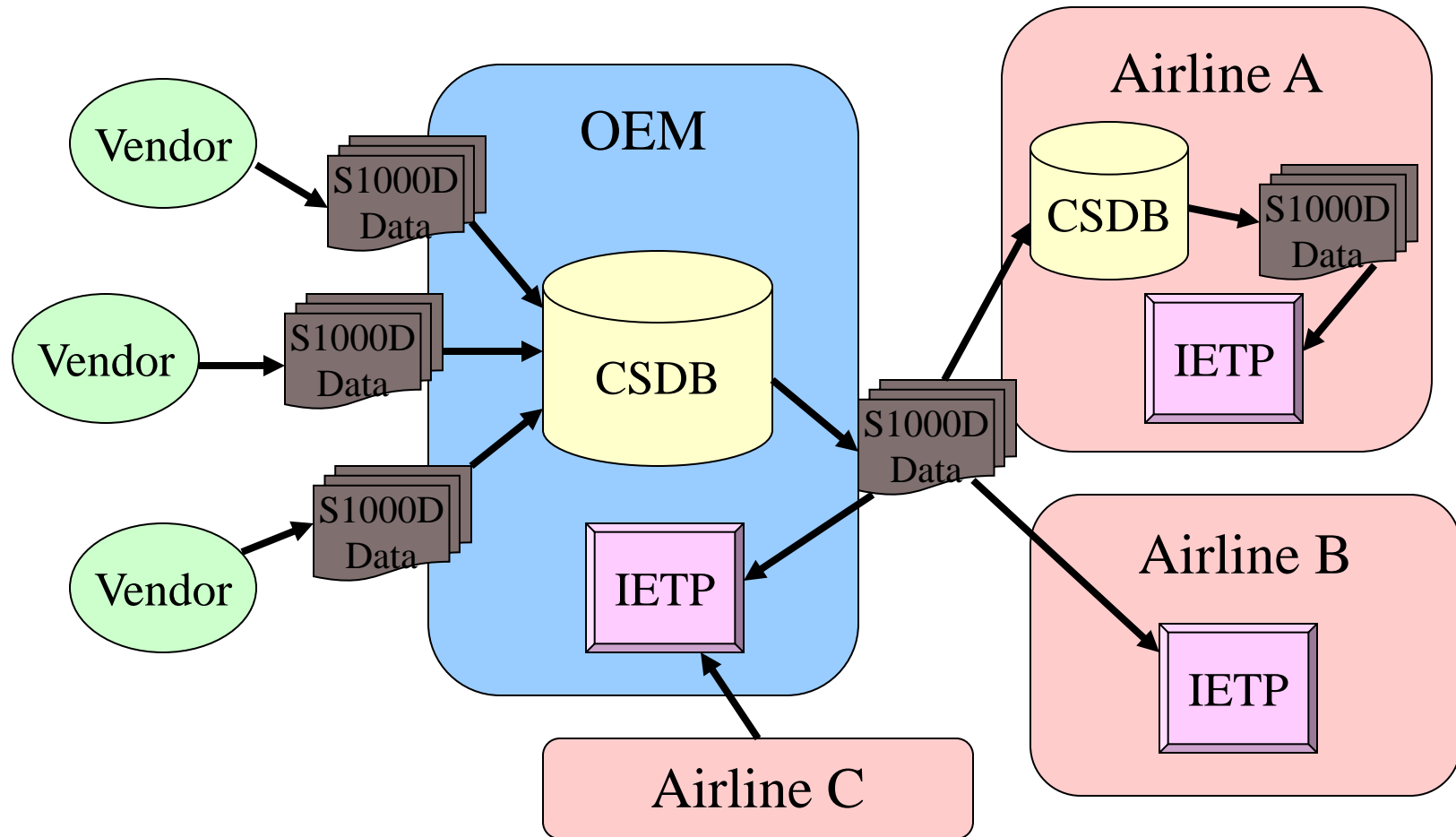
Transforming ATA iSpec 2200  
to S1000D

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# Introduction

- S1000D as Interchange Specification
- ATA iSpec 2200 vs. S1000D spec
- Minor Transforms Common S1000D
- ATA iSpec 2200 to S1000D Transformation
- Transforming Common Constructs
- AMTOSS/JEMTOSS to Data Module Code
- Targeting S1000D Version 3 vs. 4
- Airline vs. OEM Transform

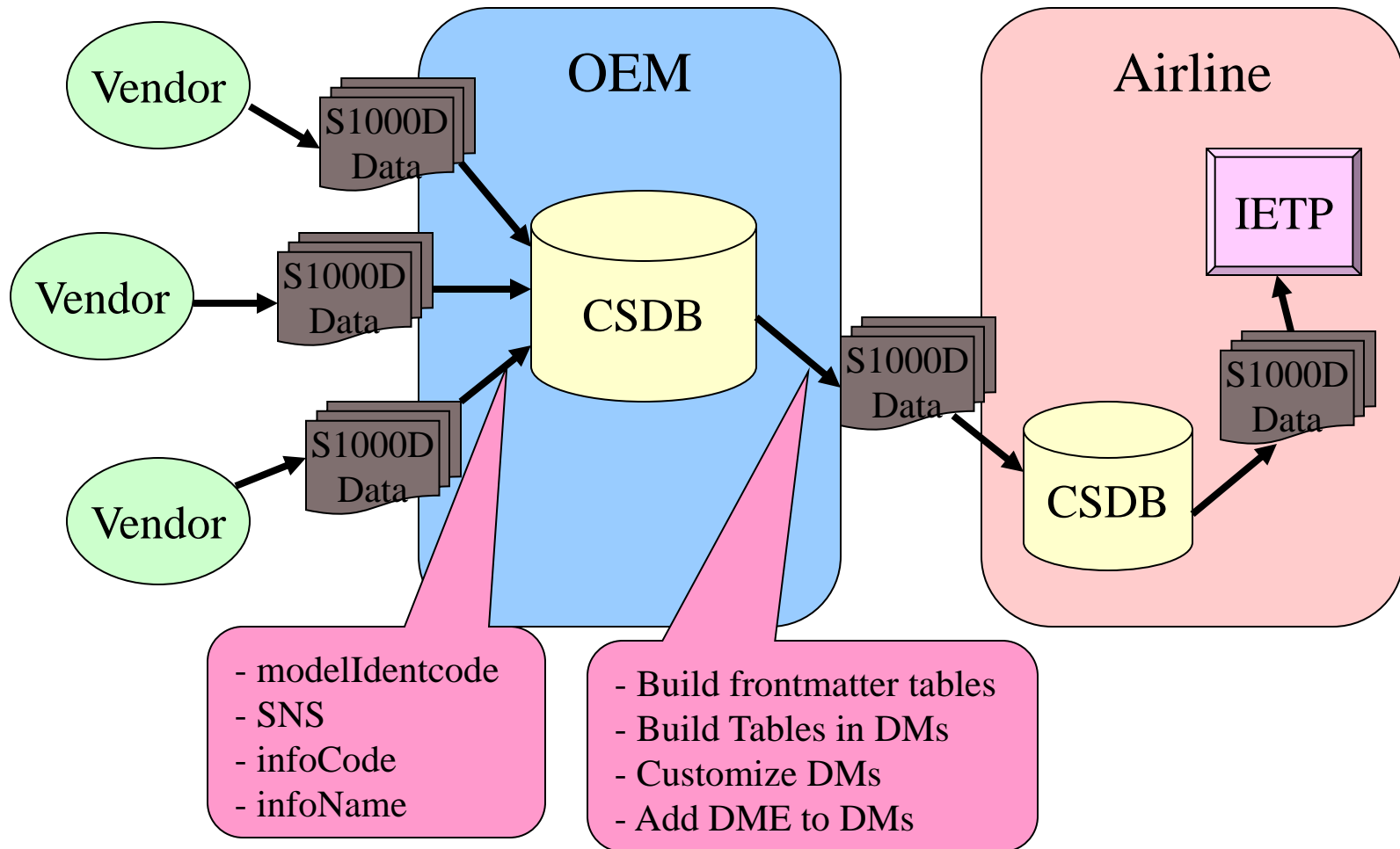
# S1000D as Interchange Specification



# ATA iSpec 2200 vs. S1000D

- **Similar goals**
- **Different era technologies**
- **Paper vs. electronic delivery**
  - OEM to airline vs. multistage pipeline
- **Monolithic document vs. Data Module**
  - Similarity of content organization
- **Comprehensive scope of S1000D spec**
- **Level of detail in the specifications**

# Minor Transforms Common in S1000D



# ATA iSpec 2200 to S1000D Transformation

- **Content**

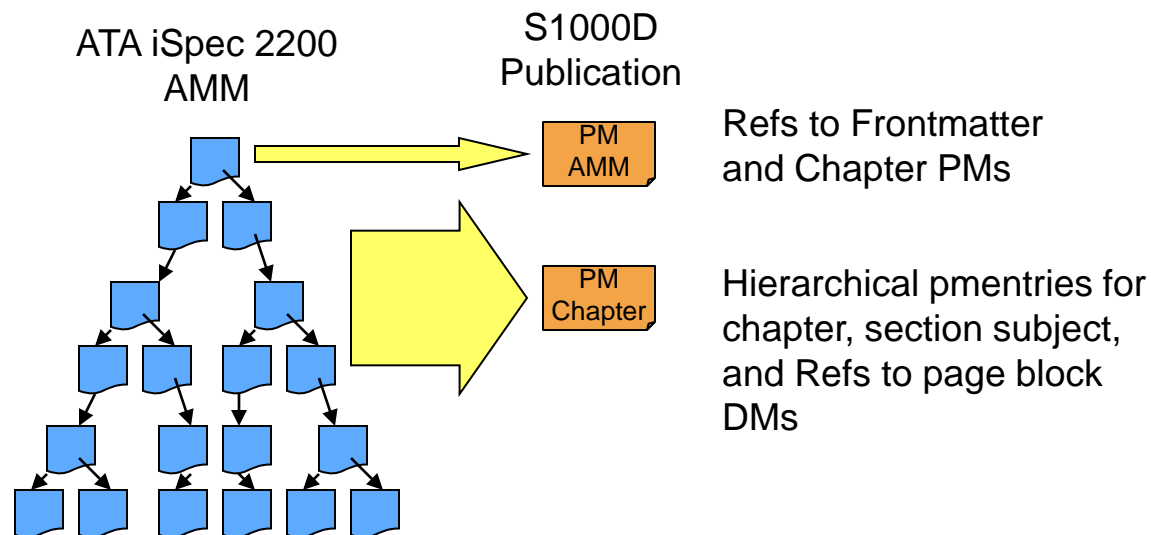
- ATA content in leaf nodes like Task, Figure, etc.,
  - Very much like DMs
- Both have data tables
  - ATA AIPC PNRFILE vs. Technical Repository module
  - ATA WDM EQIPLIST & EXTWLIST vs. elecequips & wires in wrngdata modules
  - However these have different scopes

- **Different operational paradigms**

- One-time conversion of ATA to S1000D
  - OEM converting from ATA to S1000D delivery
- Revision import of ATA converted to S1000D
  - Airline converting each OEM revision
- Conversion of ATA to S1000D w/reverse transform
  - OEM converting to S1000D internally, but delivering in both ATA and S1000D

# ATA iSpec 2200 to S1000D Transformation

- iSpec 2200 upper structure to publication module
  - Chapter, Section, Subject, ...
  - Nested PMs, one per Chapter
  - PMs maintain ordering of data modules independent of DMC

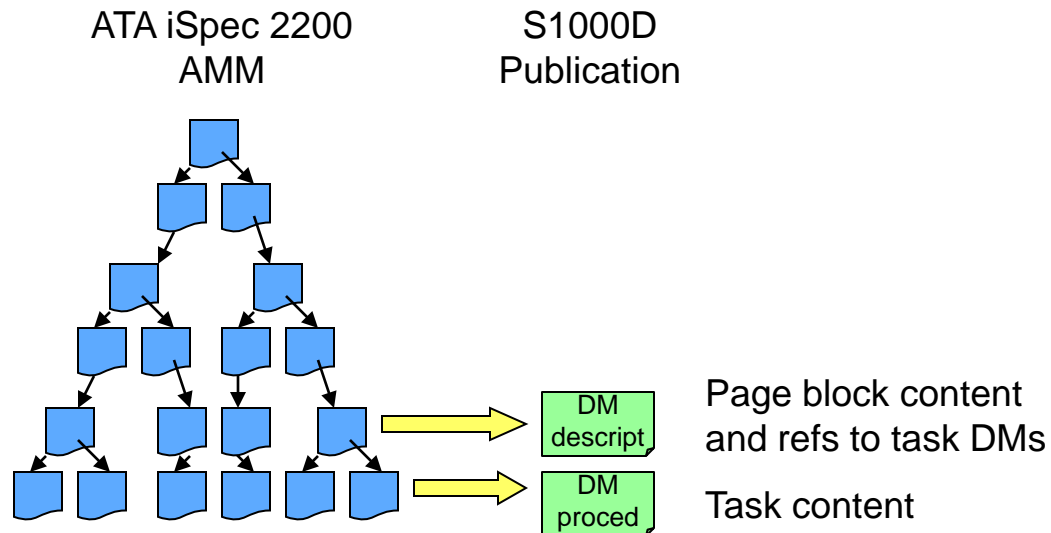


# ATA iSpec 2200 to S1000D Transformation

- **Preserving ATA manual concept**
  - Necessary if transforming back to ATA iSpec 2200
  - Publication Modules preserve essence of ATA manual
  - Visibility of ATA manual in module DMC has value
  - If mapping AMTOSS code to DMC, may be needed to keep the DMCs for DMs in different manuals unique
  - Possible places to capture ATA manual in DMC
    - `identExtension/@extensioncode`
    - `systemDiffCode`

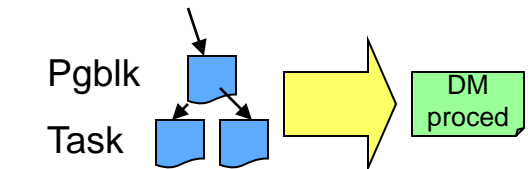
# ATA iSpec 2200 to S1000D Transformation

- **Primary content units to data modules**
  - AMM, FIM, EM Task to proced DM
  - AIPC Figure to ipd DM
  - Intro to descript
  - WDM/SSM Figure to descript

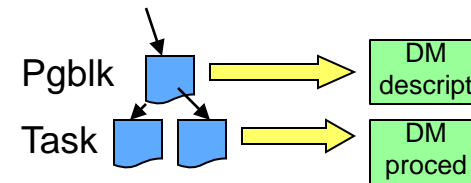


# ATA iSpec 2200 to S1000D Transformation

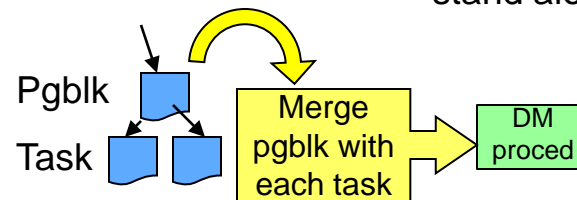
- **AMM Page block/Task vs. Stand Alone DM**
  - Generally task unit corresponds to a Data Module
  - However the parent page block anchor has content
  - Thus AMM task is not a stand alone unit



Stand alone DM, but includes multiple tasks and can be large



Good task level DM but is not stand alone



Proper task level DM but requires manual effort and/or multiple maintenance

# Transforming Common Constructs

- **Internal References**

- ATA REFINT within a manual (a large scope) using ID/IDREF
- S1000D `internalRef` within a data module (small scope) using ID/IDREF

- **External References**

- ATA REFEXT between manuals using AMTOSS code for targets that is limited to an “anchor” in the target manual
- S1000D `dmRef` between data modules using the DMC of the target DM
- S1000D can target any element within the DM that has an ID using ID/IDREF

# Transforming Common Constructs

- ATA REFINT and target in same DM after transformation
  - REFINT -> internalRef
  - REFINT/@REFID -> internalRef/@internalRefId
  - Refint/@reftype equivalent of internalRef/@internalRefTargetType
- ATA REFINT and target in different DMs after transformation and target maps to a DM (e.g. refint to a task)
  - REFINT -> dmRef
  - dmRef/dmRefIdent/dmCode populated with DMC of DM for transformed target anchor
- ATA REFEXT target maps to a DM
  - REFEXT -> dmRef
  - dmRef/dmRefIdent/dmCode populated with DMC of DM for transformed target anchor
- ATA REFEXT target or ATA REFINT target maps to an element within target DM (e.g. refint to a table)
  - REFEXT OR REFINT -> dmRef
  - DMC of DM with transformed target anchor -> dmRef/dmRefIdent/dmCode
  - REFINT/@REFID or anchor ID of REFEXT/@REFLOC -> dmRef/@referredFragment

# Transforming Common Constructs

- **ATA Illustrations**

- GRAPHIC/SHEET structure
- GNBR entity defines illustration, but open format

- **S1000D Illustrations**

- FIGURE/GRAPHIC structure
- ICN formally defined like DMC
  - Always includes the version number
  - CAGE code/illustration number based with open structure OR
  - Model based like DMC
    - Using model based SNS for ICN doesn't identify or restrict where it can be used

- **Map**

- ATA GRAPHIC -> figure, GRAPHIC/TITLE -> figure/title
- ATA SHEET -> figure/graphic
- ATA SHEET/TITLE -> ?, ATA SHEET/GDESC -> ?
  - Depends on how used
  - Not ideal, but could map to figure/legend

# Transforming Common Constructs

- **Airframe Manual Effectivity**

- Effectivity cross reference in Airframe manuals can be transformed into basic applicability modules
- Variance in effxref is summed in ACT/PCT
- Service bulletin detail can be centralized in the CCT

- **Engine Manual Effectivity (EM and EIPC)**

- Lack effectivity cross reference table
- Traditionally model based, not serial number based
- Can use hierarchical groupings
- Require manual creation of applicability modules

# AMTOSS/JEMTOSS to DMC

- **Replication vs. context**
  - ATA anchor ancestry replicated on each anchor
  - S1000D DM each carry structure in DMC
  - S1000D has no DMC like coding on elements within a data module
- **Upper level mapping**
  - Chapnbr -> systemCode
  - Sectnbr[0] -> subSystemcode
  - Sectnbr[1] -> subSubSystemcode
  - Subjnbr -> assyCode
- **Further Disassembly**
  - ATA and S1000D concepts diverge
  - Confnbr, confltr similar to disassycodeVariant
- **Function code to infocode**
  - Question: map or use as-is
  - Need to preserve core S1000D information codes (certainly 0xx)
  - Varnbr similar to infocodeVariant
- **Sequence numbers**
  - No counterpart in S1000D
  - Exists to have unique AMTOSS/JEMTOSS codes, so if mapping this is needed to ensure a unique DMC

# Targeting S1000D Version 3 vs. 4

- **Availability of structure**
  - ATA EM subtask/title to 3.0 step2/?  
vs. 4.0 proceduralStep/title
- **Readability**
- **Longevity**
- **Compatibility with new projects**

# Airline vs. OEM Transform

- **Airline**

- Endpoint, data is internal
- Can transform as desired
- Limited by tool/system support

- **OEM**

- Supplier, must deliver compliant data
- May perform one-time transform, moving to S1000D both internally and for delivery
- May perform one-time transform, but delivering in both S1000d and ATA iSpec 2200
- Any internal non-standard must transform back to standard
- ATA iSpec 2200 to S1000D 4.0 transform may require support for reverse S1000D 4.0 to ATA iSpec 2200

# Wrap-up

- **Conclusion**
- **Acknowledgements**
  - Jon Downing
  - Delta Airlines, Minneapolis
  - Rolls-Royce Group plc
- **Questions and answers**