

FAA National Software Conference, May 2002

DO-200A Overview and Experiences

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Aeronautical Data Chain

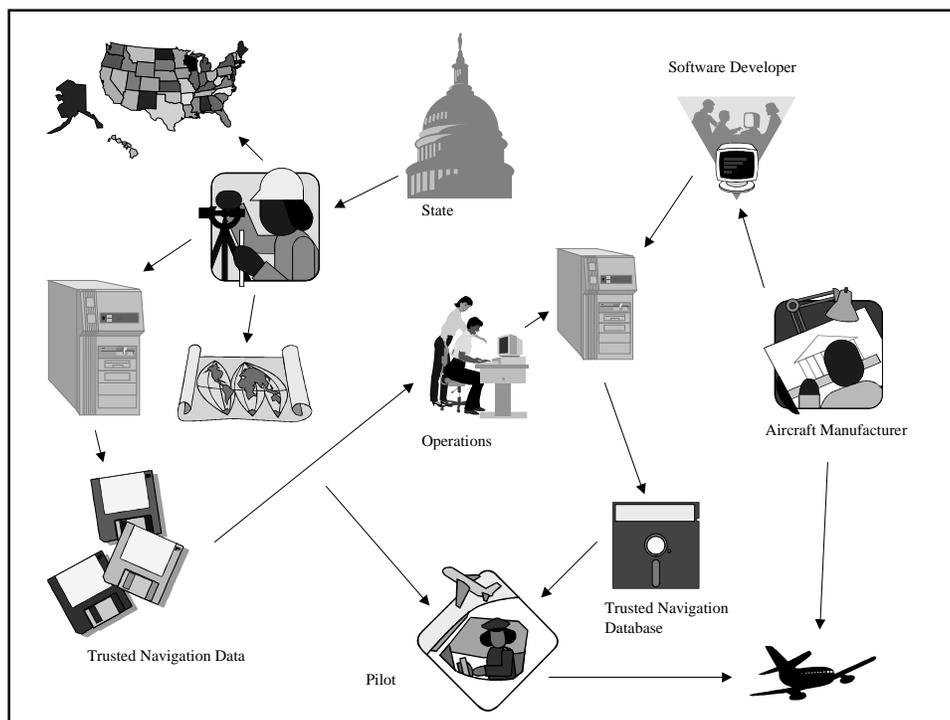
- An "Aeronautical Data Chain" is a conceptual representation of the path that a set, or element, of aeronautical data takes from its creation to its end use.
 - Aeronautical Data -- Data used for aeronautical applications such as navigation, flight planning, flight simulators, terrain awareness and other purposes, which comprises navigation data and terrain and obstacle data.

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What will we be talking about?

- Will layout an example of an Aeronautical Data Chain
- For a piece of this Aeronautical Data Chain
 - Approval Authority and Method
 - Data Transformation Assurance



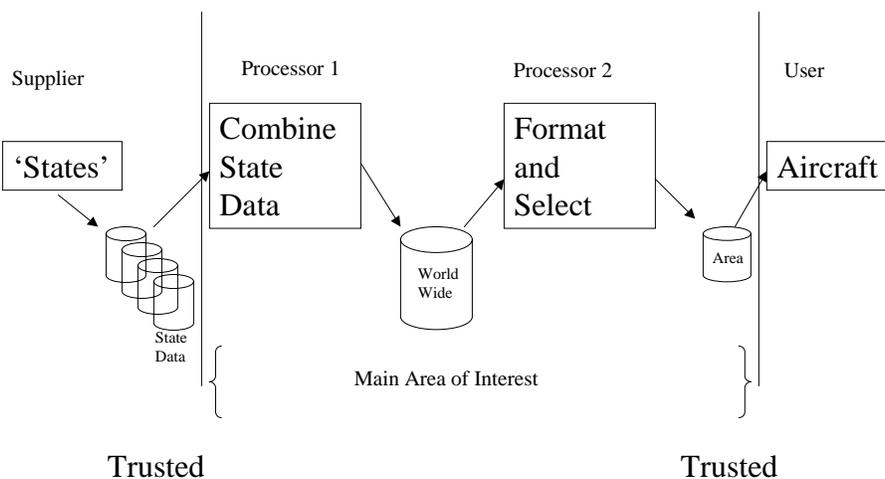
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Example Data Chain

- Simplify to a few boxes
- Does not include entire Aeronautical Data Chain
- Use as basis for presentation and discussion of issues

Example Data Chain



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'States'

- Definition in DO-200A
 - 'For navigation data, an approved supplier is either a State or a RTCA DO-200A/EUROCAE ED-76-compliant supplier'.
- 'State' is not defined.
 - ICAO recognized?
 - Delegation by a 'State'?
- Difficult to determine if a supplier is a 'State' or needs to be in compliance.

User/Aircraft

- Current Type Certifications do not address Databases.
- Current operational rules address navigation databases but do not support the Aeronautical Data Chain concept.

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Processor 1 & 2

- Generally ground based systems.
- Can be mixture of COTS and custom developed applications supporting data transformations and storage.
 - Storage - COTS software
 - transformations - custom developed software
- Organization processing the data may not be the developer of the application software

Processor 1 & 2

Approver?
Approval Method?

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Processor 1 & 2 - Approver

- Section 3 of DO-200A
 - When it talks about who would do an audit of compliance uses the phrase ‘for example the user of the supplied data or a regulatory authority

Processor 1 & 2 - Method

- A new kind of TSOA
 - ‘Process’
- Like equipment manufacturers
 - manufacture an approved part - the database
- As part of a TC or STC for an aircraft

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Data Transformation Assurance

Main topic Automated Transformations

Expect decisions to be questioned.

Expect new issues to be brought forward.

Data Transformation Assurance

- A consideration for both Processor 1 & 2
- Covered in section 2.4 of DO-200A
 - Data integrity in all steps
 - Problem reporting (Feedback to data supplier)
 - Manual transformations
 - Automated transformations

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Automated Transformations

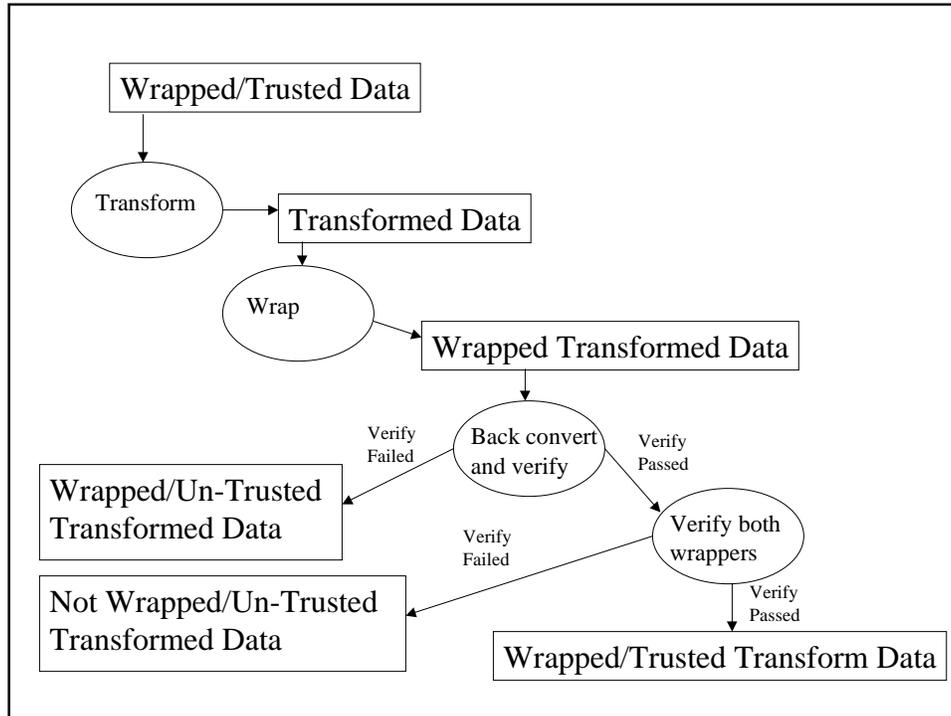
- Section 2.4.5 of DO-200A
 - Uses the words ‘Tool Qualification’ (See Figure C-7)
 - Describes in words similar to DO-178B’s ‘Tool Qualification’.
 - Calls for Tool
 - Qualification Plan
 - Requirements
 - Qualification Procedures (verification)
 - Configuration Management
 - Documentation.

Automated Transformations

- Treat software developed as Tool Software
 - Have developmental tools and verification tools
- Can we reduce the problem to verification tools only? (Level 1?, Level 2?)
 - See figure C-6 of DO-200A
 - Need additional tests for types of transformations?

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Back Convert Issues

- 1 to 1
 - Representation of data accuracy
 - Change in resolution or accuracy
- 1 to Many
 - same as 1 to 1
- Many to 1
 - How to back convert? Use all the original data but the one with the largest range?

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Transformation Issues

- Dealing with design errors
 - What kind of testing is needed?
- Differences between Transformation and Back Conversion?

Issues from discussions