

The joys of standardized data and the rocky road to seamless integration

An end-user perspective



Lufthansa Technik

Who is presenting?

Ralf Thänert
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Corporate IT



Engine
Services



Aircraft
Component
Services



Aircraft
Maintenance
Services



Orig. Equipment
& Special A/C
Services



Digital Fleet
Services



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Digital thread for the industry



**Component
supplier**

**Aircraft
OEM**

Operator

MRO

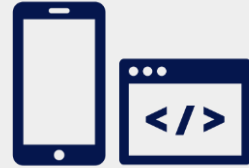
Vision

Data form the digital thread connecting all partners
Standards allow feedback and multiple use of data

Why use standards in the digital thread?



CSDB by OEM



**Data accessible from
all devices**



**Clear feedback between
all partners**

**0011
1010
1001**

**Reports create reliable
planning data**



**CSDB data feed into
other documents**



OEM 2

**Integration of data by
several OEMs**



Design Partner

**Every responsible partner
can create adaptations and
modifications**



We do not use the full potential of standards

- Few revisions
- Incremental changes
- Temporary revisions

- Structured data
- Book idea retained
- Incremental changes
- Temporary revisions

- Data Module idea
- Strict specification
- More rules

- On-demand revisions
- Increased flexibility
- Quick changes

**Paper Book
Manuals**

ATA iSPEC

S1000D

**New
digitalization
tools**

- Few guidelines
- Individual styles and processes

- Individual interpretations of the Standard possible
- Standards not used (iSPEC2400 and iSPEC2500)

- Book idea retained
- Incremental Changes retained
- Rules not used / enforced

- Individual styles and processes per type
- Individual solutions per publication observed

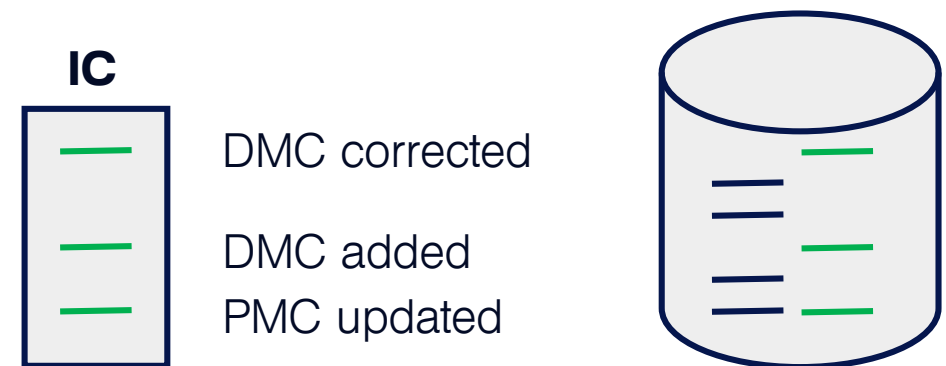
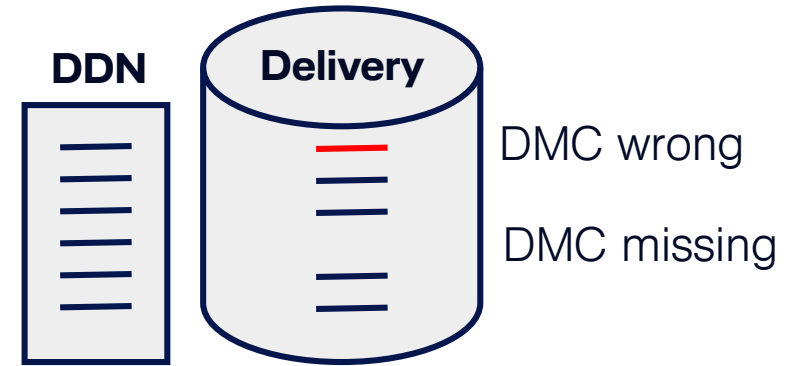
Incomplete deliveries / wrong data

Book idea:

Use incremental changes (IC), never intended in S1000D

Questions:

- Is the IC optional?
- Will the IC be retained in the next publication version?
- Publication version ID and PMC issueNumber differ



 **The thread is weakened**

Which issue of the specification to use?



Use the new 5.0 or the older 4.1/4.2?

Use an outdated issue (3.0)?

Use the Business Rules as defined?

Use a proprietary format or an existing standard,
e.g. iSPEC2400 and iSPEC2500.



 **The thread is weakened**

BREX Decisions should be followed

```
68 <brexDmRef>  
69 <dmRef>  
70 <dmRefIdent>  
71 <dmCode assyCode="0301" disassyCode="00" disassyCodeVariant="A" infoCode="022" infoCodeVariant="A" itemLocationCode="D" modelIdentCode="S1000D" subSub  
72 </dmRefIdent>  
73 </dmRef>  
74 </brexDmRef>
```

BREX delivered, but not referenced in Data Modules

SNS missing

Attribute value for element found but not declared

```
▼ <snsSystem>  
  <snsCode>05</snsCode>  
  <snsTitle>Time Limits</snsTitle>  
  ▼ <snsSubSystem>  
    <snsCode>0</snsCode>  
    <snsTitle>MISSING TITLE</snsTitle>  
    ▼ <snsSubSubSystem>  
      <snsCode>0</snsCode>  
      <snsTitle>MISSING TITLE</snsTitle>  
      ▼ <snsAssy>  
        <snsCode>00</snsCode>  
        <snsTitle>MISSING TITLE</snsTitle>  
      </snsAssy>  
    </snsSubSubSystem>
```


 **The thread is weakened**

Deleted means deleted – or does it?

Text marked as "deleted" defined as "to be used"

```
<commonInfoDescrPara>
  <title>General</title>
  <para changeMark="1" changeType="delete" reasonForUpdateRefIds="██████████">This repair must only be done when
</commonInfoDescrPara>
```

Keep deleted Data Modules as changed - or deleted?

██████████	IssueDate: 01.02.2019 (changed)
Engine General (Blend)  ██████████ 000-00A-649A-B_004-00	
<i>Common information</i>	
TASK ██████████ 00-003 Engine General - HP Compressor Rotor Blade ██████████ - Dressing of Damaged Leading/T ██████████ ██████████) - DELETED	

 **The thread is weakened**

S1000D is XML, not PDF.



Use PDF images framed in XML and declare this valid S1000D
Data will show, but cannot be extracted

```
<?xml version="1.0" encoding="UTF-8" ?>
<sbSummary>
  <?edoc id="sbSummary"?>
  <sbTopic sbTopicType="sbtt02">
    <sbTopicContent>
      <multimedia id="S0057D0C7">
        <title>PDF version of Service Bulletin</title>
        <multimediaObject id="S0057D134" infoEntityIdent="ICN-[REDACTED]-A-001-01" multimediaType="other"/>
      </multimedia>
    </sbTopicContent>
  </sbTopic>
</sbSummary>
```

The screenshot shows a software interface with a document viewer on the left and a table of changes on the right. The document viewer shows a list of pages from Page 1 to Page 7. The table on the right is titled "Printed in" and contains two sections: "Bulletin Initial Issue" and "Supplement Initial Issue". Each section has three columns: "Remove", "Incorporate", and "Reason for change".

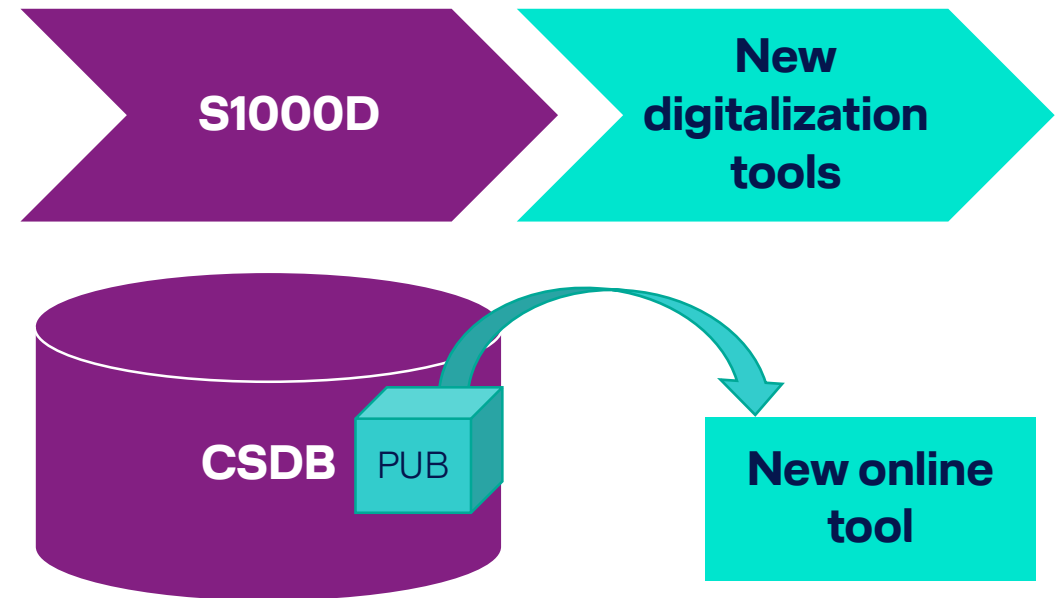
Remove	Incorporate	Reason for change
	Pages 1 to 6 of the Service Bulletin	Initial Issue
	Page 1	Initial Issue

The thread is weakened

Stay in one standard

One particular publication is migrated into a new environment:

- Large parts of the interconnected data cannot be repurposed.
- Data cannot be modified as easily as in standard data.
- Users have to use at least two systems.



➔ **The thread is weakened**

Why is it as it is and what can we do?

Inertia

Fear

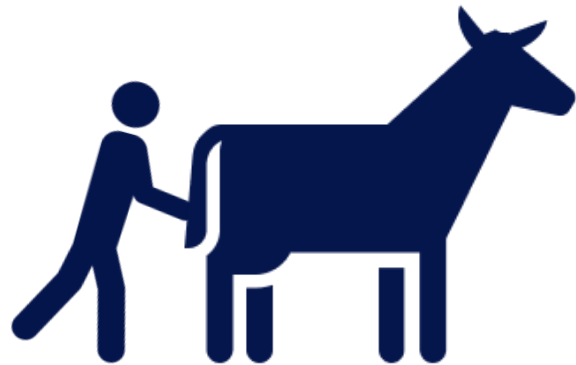
Balance of Power

Quick market – slow standards



Inertia - What can we do?

Inertia: Old processes are working, no capacity for constant changes



Constantly **ask partners** upstream and downstream to **use standards**



Fear - What can we do?

Fear

Loss of IP and market power



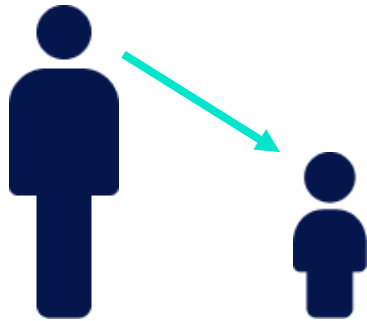
Create Trust

by cooperation, behaviour, contracts

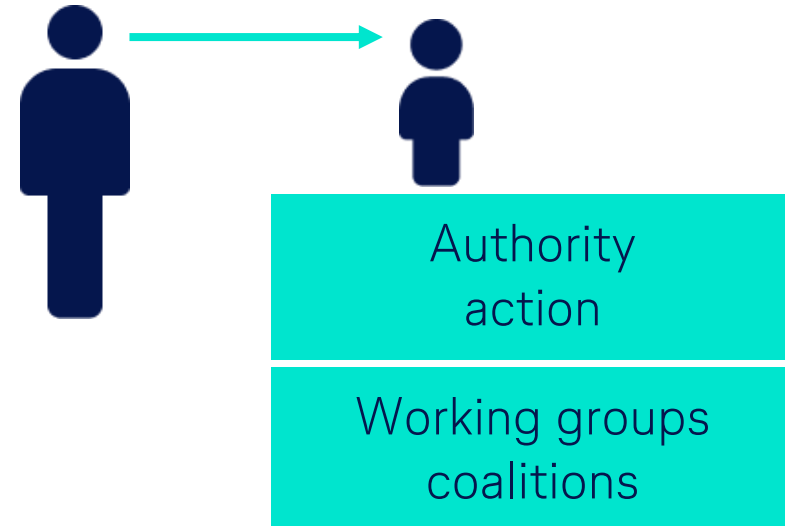


Balance of power - What can we do?

Uneven **balance of power**



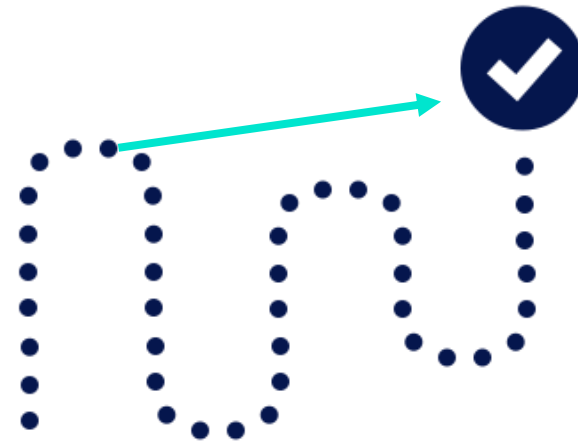
Standard **enforcement**



Quick market meets slow standard - What can we do?

New market demands are not filled
by standardization **quickly** enough

Create **short cuts** for solutions,
even if temporary



Why is it as it is and what can we do?

Inertia

Fear

Uneven power distribution

Quick market – slow standards

Constantly ask partners

Create Trust

Standard enforcement

Create short cuts

Strengthen the digital thread!

- Take part in the ATA Working Groups
- Deliver technical data using the existing standards
- Enforce the existing standards
- Make data reliable to use for the end-user



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