

Aeronautical Data Quality – A New Challenge for Surveyors

by

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Overview



- Introduction and Motivation
- Aeronautical Data Quality
- Aeronautical Information Exchange Model
- ADQ and Surveyors
- Next steps

- International air traffic has reached its limitations due to steady growth and demands optimization of the air traffic management
- ICAO initiated a cooperation of
 - aircraft industries
 - airlines
 - airports
 - air traffic control
 - surveyors
 - FAA (Federal Aviation Administration)
 - EUROCONTROL
 - EASA (European Aviation Safety Agency)

Result: demand for modern air traffic management with aspects of data quality, integrity, reliability and assurance

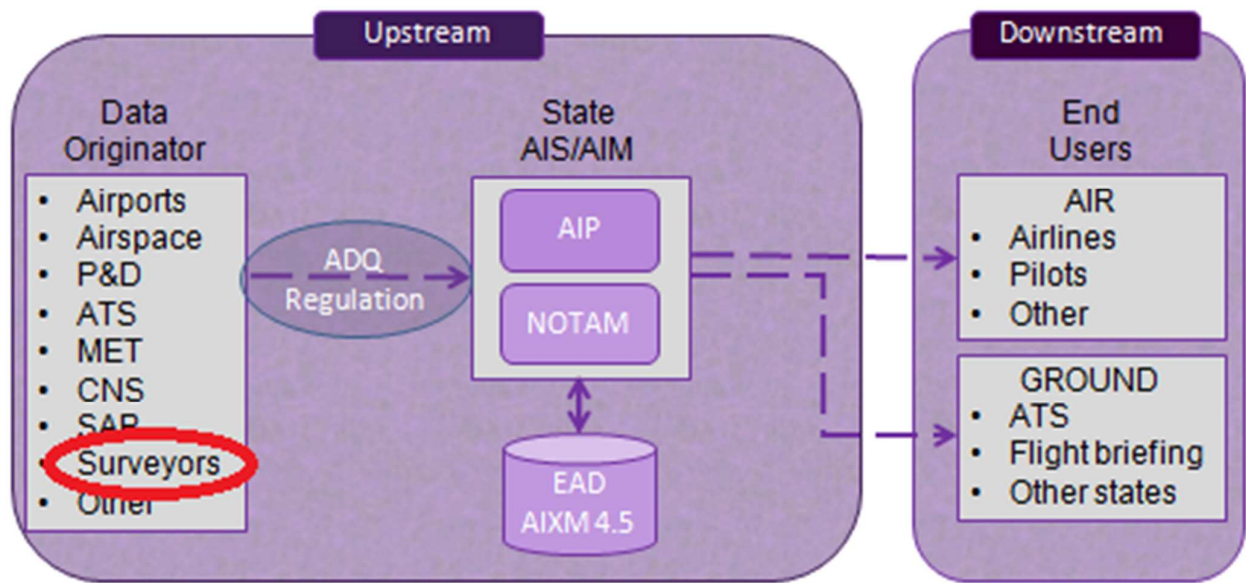
 **Global Air Traffic Management Operational Concept, 2003**

EU Initiative

- 2004: Frame concept (ICAO standards integrated)
- 2004: European Commission Regulation about Interoperability including aims for interoperability, safety, cost efficiency and environment protection
- 2009: European Air Traffic Management Master Plan, with focus on aeronautical data and aeronautical information
- 2010: European Commission Regulation 73/2010, requirements on the quality of aeronautical data and aeronautical information for the European single sky



ADQ Implementing Rule



The exchange format in between all steps is AIXM 5.1

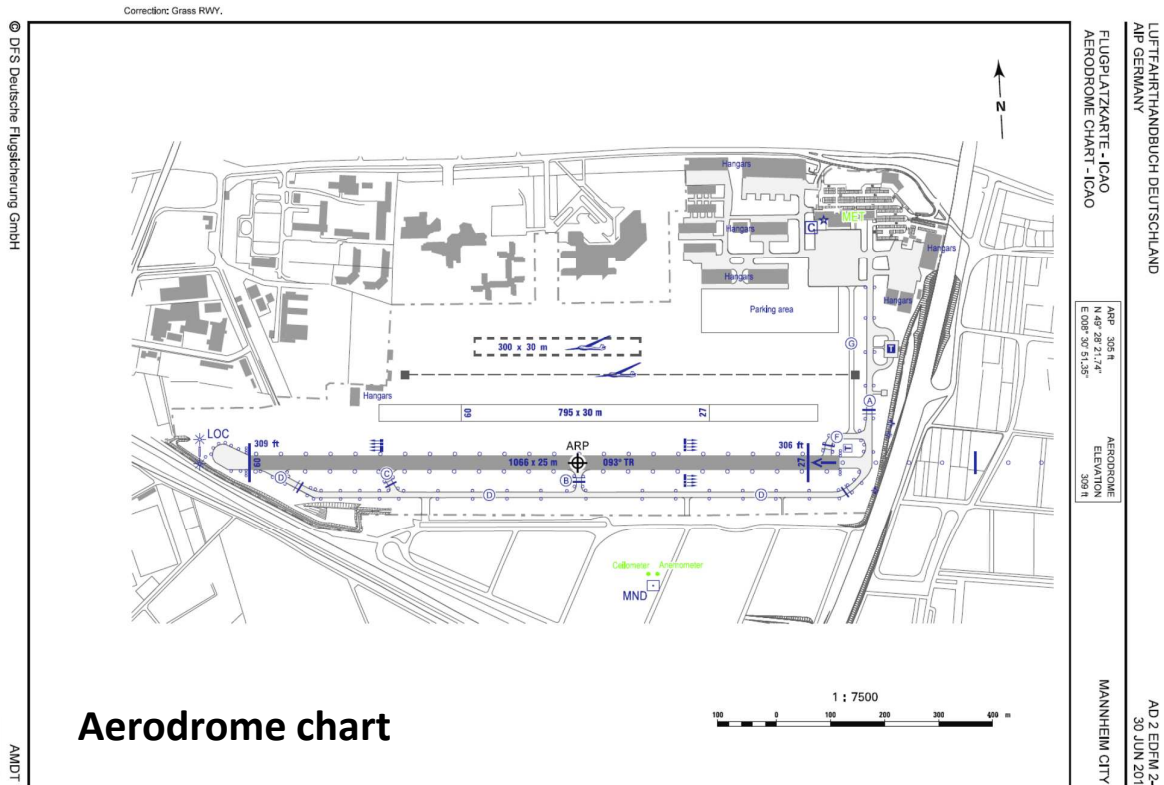
- **Structured electronic data**
- **Lossless transfers**
- **Electronic work flow management**
- **Documentation of all involved parties and individuals**
- **Documentation of purchase order, used equipment, calibration reports, date and time of operations, used software, reference information (datum)**
- **All coordinates are x, y, z (as attribute) and time**
- **Complete chain must be ADQ compliant**
- **Due to the amount of metadata the complete history can be recovered**

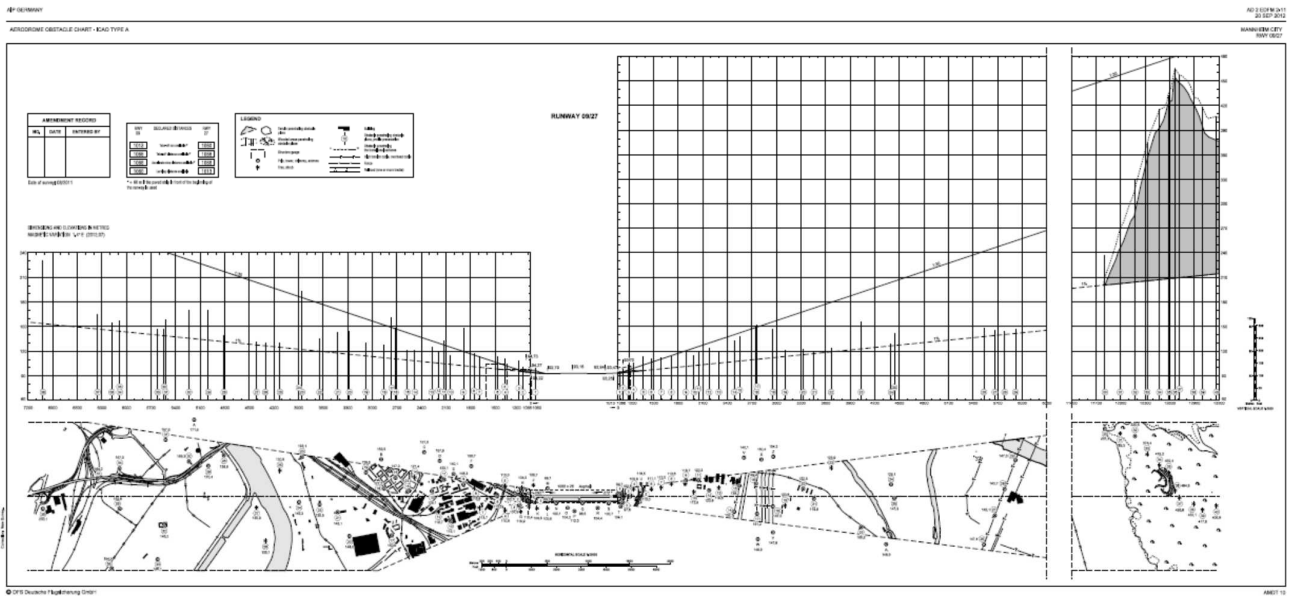
- The latest version of the Aeronautical Information Exchange Model is AIXM 5.1
- Enable interoperability between the actors of the aeronautical data chain
- Some rules:
 - unified modeling language (UML) or feature catalogue
 - temporality concept (time slice objects)
 - geographical information – spatial concept, i.e. points, curves and surfaces
- Data encoding by Extensible Markup Language (XML) resp. GML for geographical data which should be provided by standard GIS software

- Example of dynamic feature (here runway) with time slice property

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    </extension>
  </complexContent>
</complexType>
```

- Surveyors are involved in capturing and updating terrain, obstacle and aerodrome data, called ETOD
- This information will be published later in the AIP, the aeronautical information package
- Defined by ICAO:
 - feature catalogue
 - horizontal reference system WGS 84 (geographic coordinate system)
 - height reference system EGM 96
 - temporal reference Gregorian calendar and UTC
- All data transformations to be documented in metadata
- Each action and interaction to be documented including personalized data





Aerodrome obstacle chart

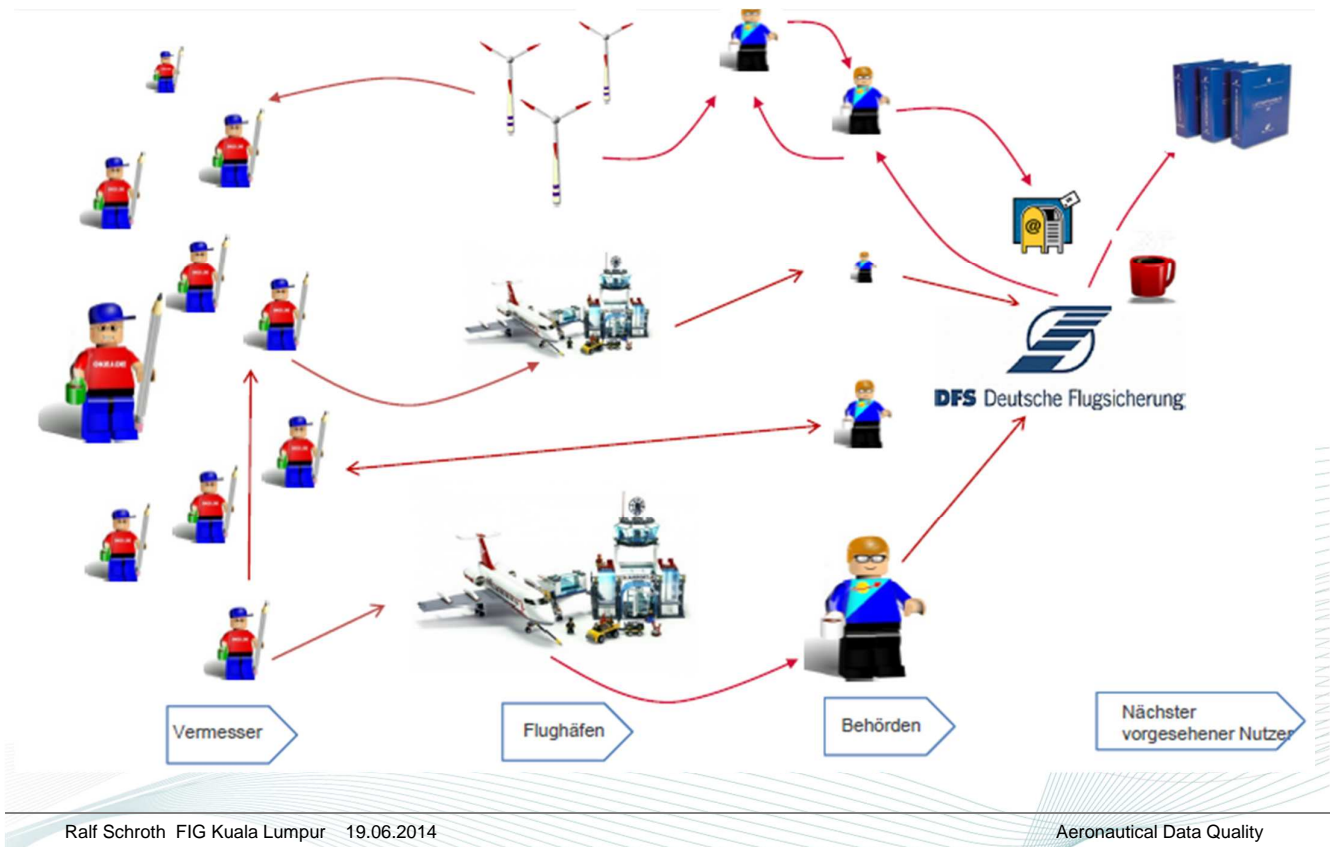
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Aeronautical Data Quality

- Demand for electronic work flow management system starting from incoming purchase orders at the surveyors office as data originator till the delivery of AIXM data
- Not covered by standard office software
- GIS suppliers are on their way like ESRI (limited to AIXM 4) or Bentley 's MAP Airport Data Model (just GML)
- Extensive variety of metadata to be delivered

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Aeronautical Data Quality



ADQ – Next Steps

- Surveyors community has very few awareness of the actual situation to be compliant with FAA and ADQ regulations
 - 2 Service Providers coming from aeronautical information services and surveying services teamed up and offering
 - consultancy
 - training
 - work flow management and audit
 - AIXM 5.1 conversion
- in this new field of Aeronautical Data Quality



- Deadline for ADQ compliance of **30.06.2017** is challenging



**Thank you
for your attention**

GroupEAD ADQ4u
The ADQ Expert Team