Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin
Nationales Metrologieinstitut

Technical part of the DCC – new updates and software

Temadag om digitale kalibreringscertifikater (DCC)

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Introduction

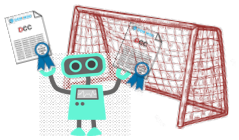
Motivation for the DCC

- Emphasised **characteristics** of the DCC:
  - Free of change in used media

  - Machine readable (under adherence of few requirements)
    - Application of fixed structures.
    - Application of consistent terms, e. g. measurement uncertainty.

  - Machine interpretable
    - Example: „I am a force transducer.“
    - Unambiguous terms and rules necessary.

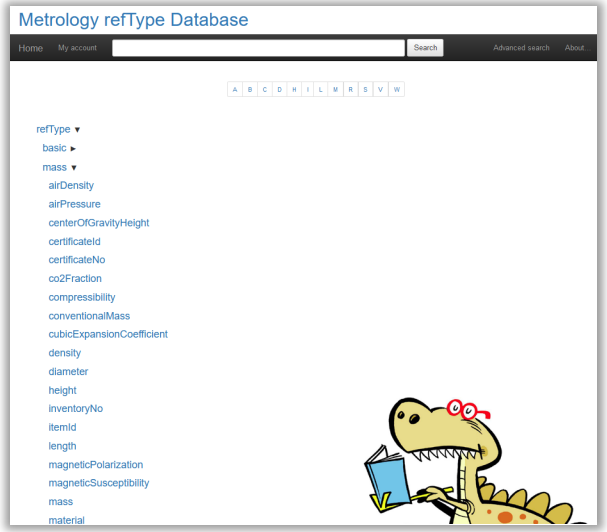
- Aim of the application of the DCCs:
  - Automation of the processing of calibration certificates.

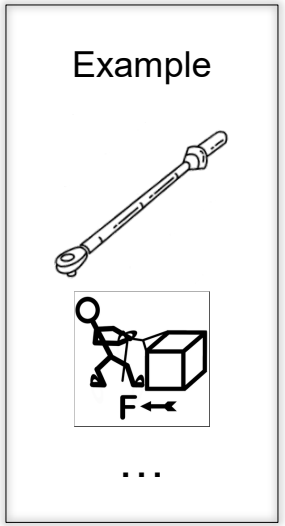


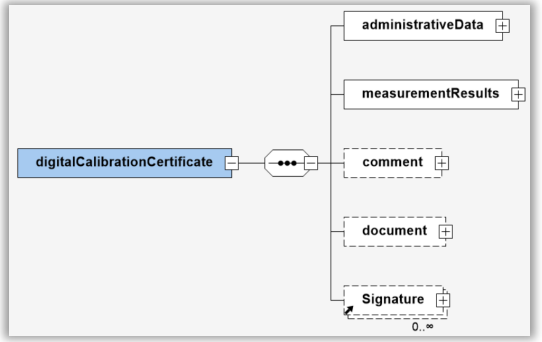
DCC news

News

- **PTB:**
  - Database (Thesaurus) for PIDs und refTypes is under construction.
  - Creation of **D**CCs for several measurands.
  - Further development of the **D**CC Schema.
  - Stronger integration of the **D**CC in QI-Digital.







QI DIGITAL

https://digilab.ptb.de/oiml-g-18/vocab/index.php

News

- **DKD:**
  - Technical sub-committee for cross-sectional **D**CC topics installed.
  - Preparation of Use Cases just started.
  - DKD board in exchange with various associations.

USE CASE

PTB

DKD

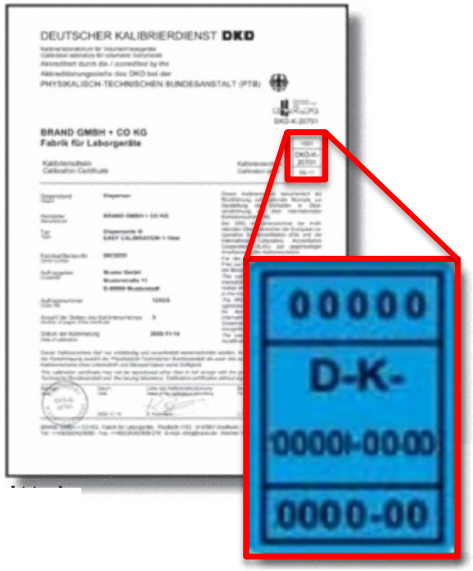
VUP

VDMA

…

News

- **DAkkS:**
  - Pilot project for the introduction of the digital seal/signature about to end.



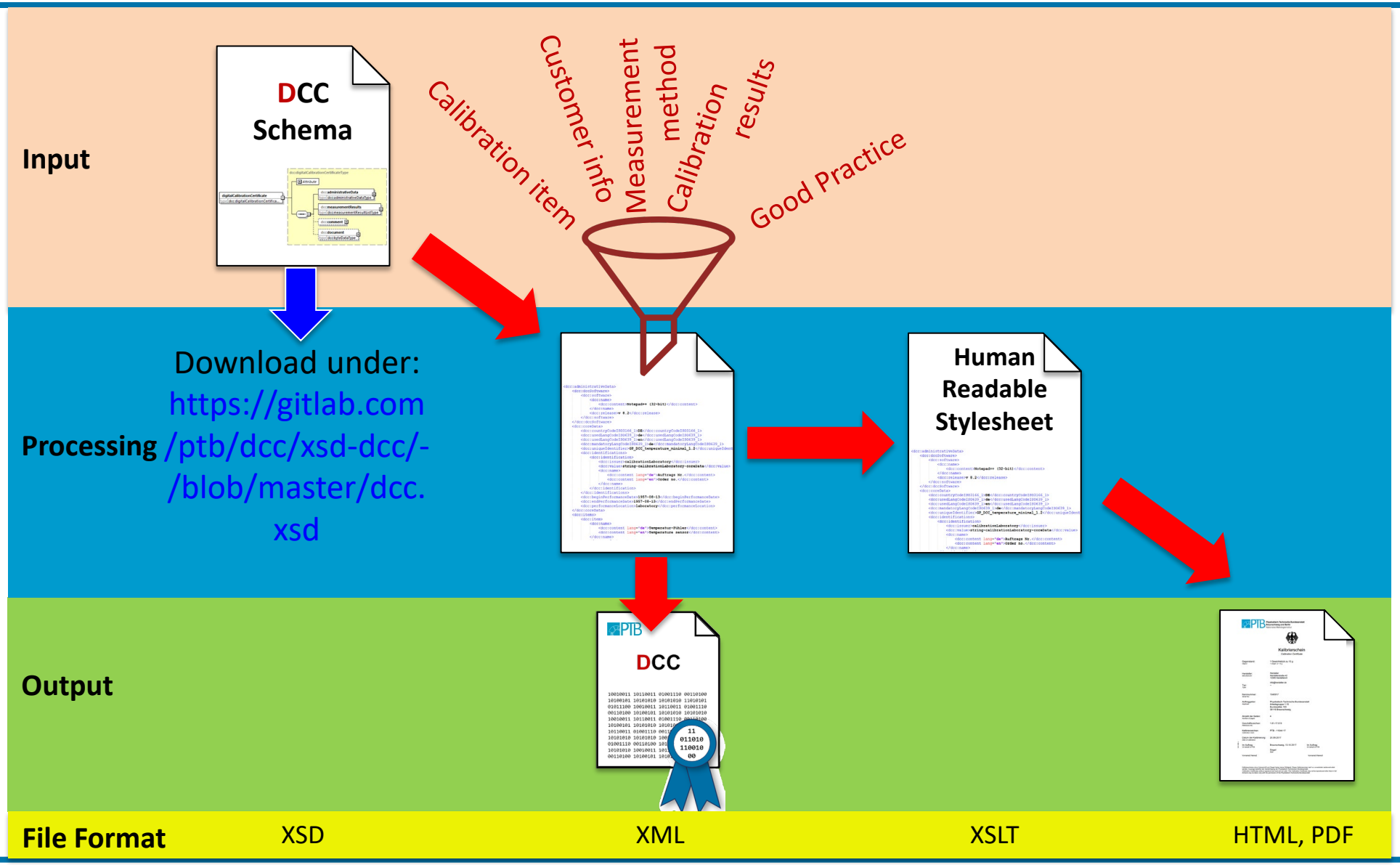
Software for the DCC

Which software is needed?

Software for the DCC?

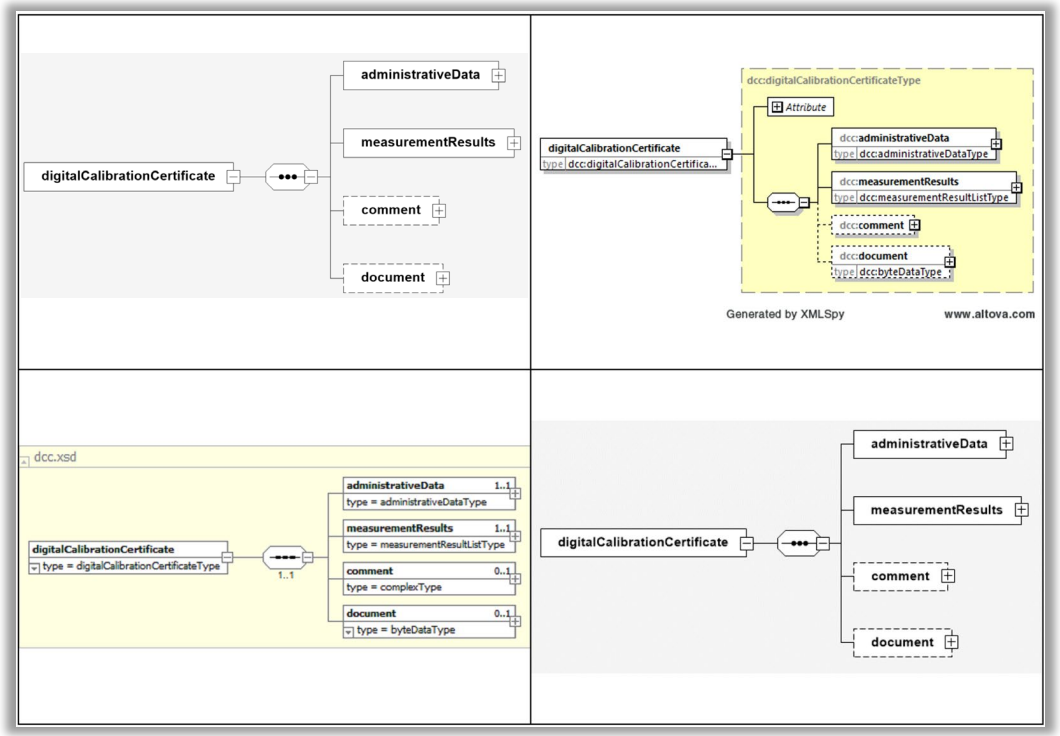
- That **depends on**:
  - Your existing IT infrastructure.
  - Your desired degree of automation.
  - Your accepted costs.
  - Your IT competences.
  - Your preferences.
  - …

How to create a DCC?



Software for the DCC?

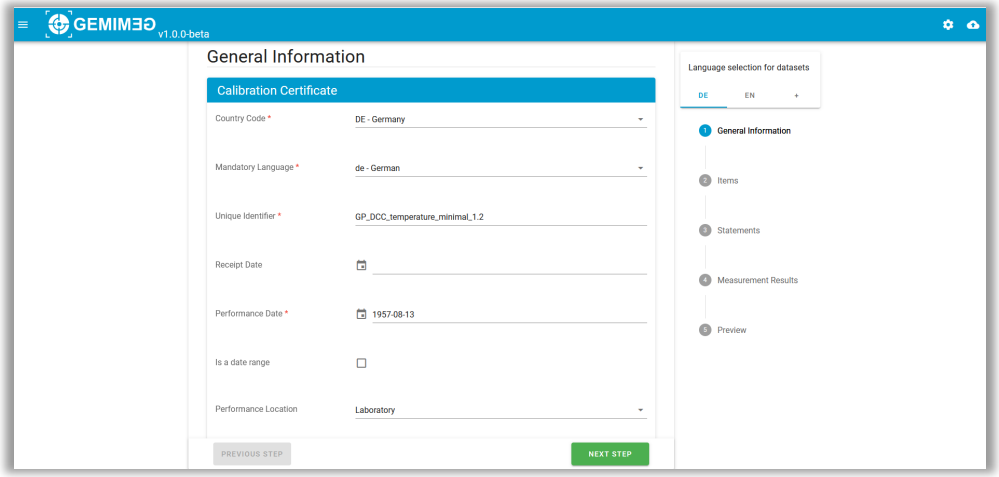
- Basis: DCC Schema viewer (XSD Viewer)



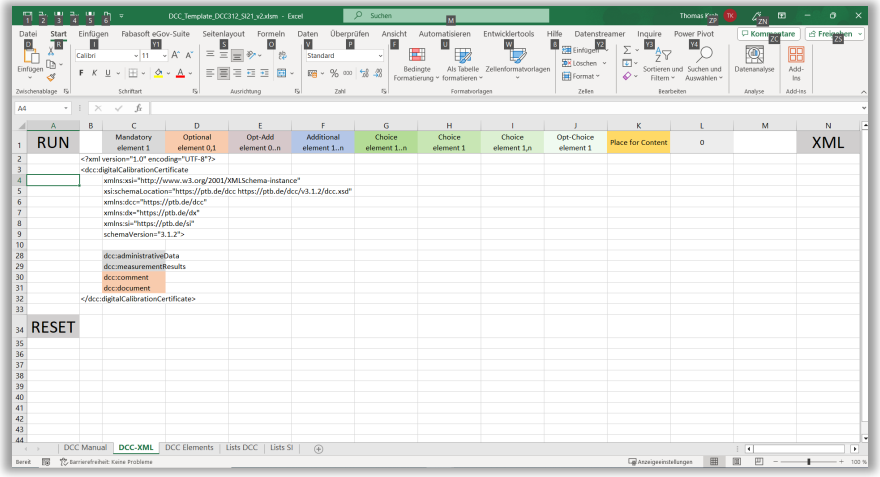
Upper left: *XSD Diagram*. URL: http://regis.cosnier.free.fr/?page=XSDDiagram
Upper right: *XML Editor: XMLSpy*. URL: https://www.altova.com/xmlspy-xml-editor. - picked up on 2020-04-20
Lower left: *XmlPad is a professional editor for XML documents created by Semyon A. Chertkov.* URL: https://xmlpad-mobile.com/#XmlPad. - picked up on 2020-04-20
Lower right: *XSD Schema Documentation Made Easy - Innovasys*. URL: http://www.innovasys.com/productinfo/dx/xsd/?k=XSD+Diagram&gclid=EAIaIQobChMInp62-KXN5AIVzOR3Ch1iDgPLEAAYASAAEgIss_D_BwE. - picked up on 2019-09-13

Software for the DCC?

- Provided by PTB:
  - Middleware solutions:
    - Gemimeg-Tool (Tool for writing and reading a DCC)
    - Excel Tool (Tool for writing a DCC including measurement data)
    - CSV**2**DCC (Tool for writing measurement data from a CSV file into a DCC).



Screenshot of the Gemimeg-Tools



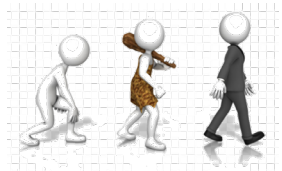
Excel Tool for a DCC. Measurement data saved in Excel file

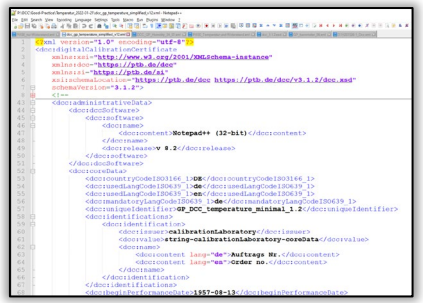
Software for the DCC?

- Currently known commercial vendors:
  - Mapping software
    - AnyDcc from Stotz-Software
    - Created by your own within the framework of a workshop of www.da-plus-d.de. Available for Windows und iOS.

Software for the DCC?

- Integrating in your existing software environment:
  - Further development of your own existing tools.
  - Text editors:
    - Notepad++, Editor, Word, …
    - More comfortable: software development environments like e. g. Visual Studio Code, XMLNotepad, oXygen, …



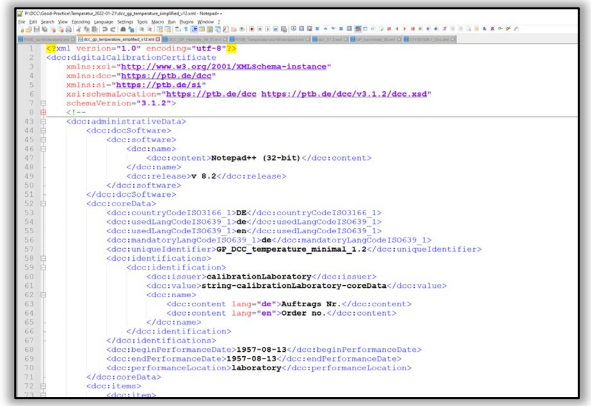


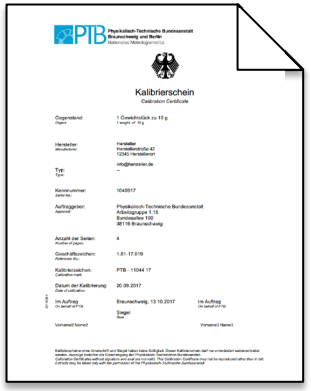
Example Notepad++

Done!

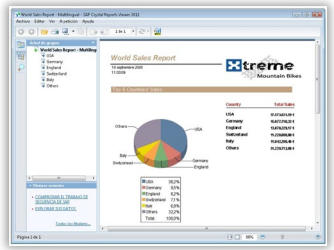
Software for the DCC?

- For a **Human Readable**:
  - Text editors:
    - Notepad++, Editor, Word, …
    - More comfortable: software development environments like e. g. Visual Studio Code, XMLNotepad, oXygen, …
  - Middleware solutions:
    - SAP Crystal Reports
    - …

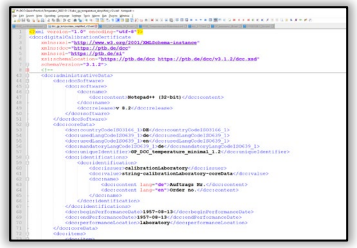




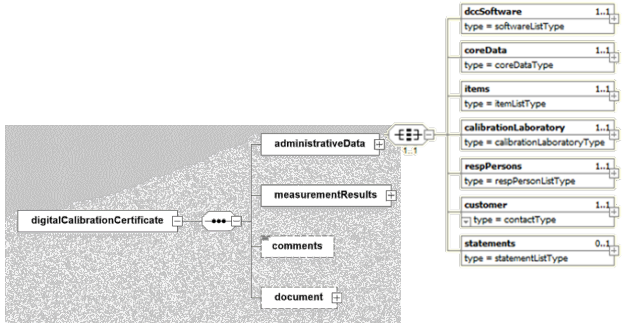
crystal reports



Software for the DCC?



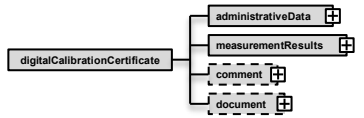
- **Validation** of a DCC:
  - Validation possible with:
    - Text editors: Notepad++, oXygen, Visual Studio Code, … Editors like Word or Editor are unsuitable.
    - Schematron.
  - What is validated?
    - With text editors:
      - The validation is carried out against the DCC schema.
      - The formal compliance is tested.
      - Check of the content is not performed.
    - With Schematron:
      - Flexible check.

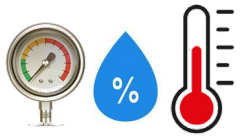


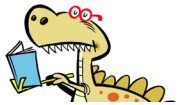
Summary

Summary

- **Ready for use** components:
  - **D**CC schema defined and long term stable (XSD-file).
  - Human Readable (XSL-file).
  - Validation possibility incl. tools.
  - Good Practice examples for temperature, humidity, pressure.
  - Thesaurus for **D**CC wording
  - Envelope (possibility to create **D**CC bundles) (draft).







DCC – an outlook

Save-the-Date

- 4th DCC Conference 2024

From 2024-02-27
to 2024-02-29
online

DCC-LinkedIn Group

DCC – an outlook

Save-the-Date

- IMEKO World Congress 2024

www.imeko2024.org

DCC User Forum:

https://digital.ptb.de/dcc-user-forum

Wednesdays 9:00-10:00 & 16:00-17:00 CET

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Stand: 10/23

Appendix

Advantages of the DCC

- **Advantages** by using the DCC:
  - Relieving staff of administrative tasks.
  - Lower error rates for transmissions.
  - New additional knowledge can be generated.
  - Time saving.
  - Cost saving.

→ Advantages are only achieved through appropriate automation.