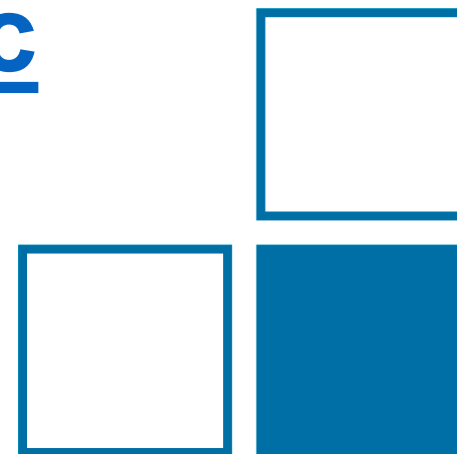


# The **DCC** and the **DTC**

**One Norm(family) / One Format**

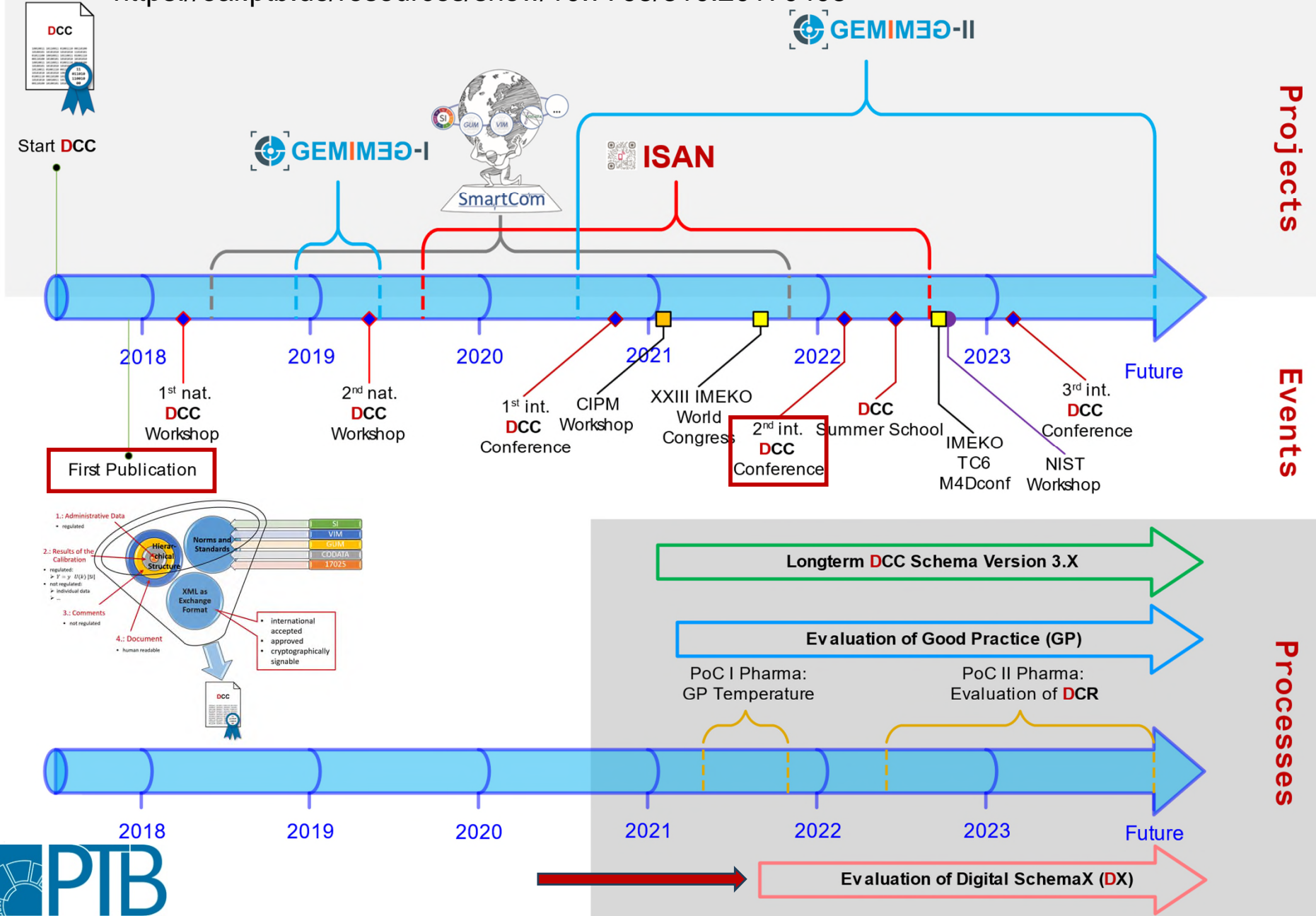
<https://www.ptb.de/dcc>

Siegfried Hackel

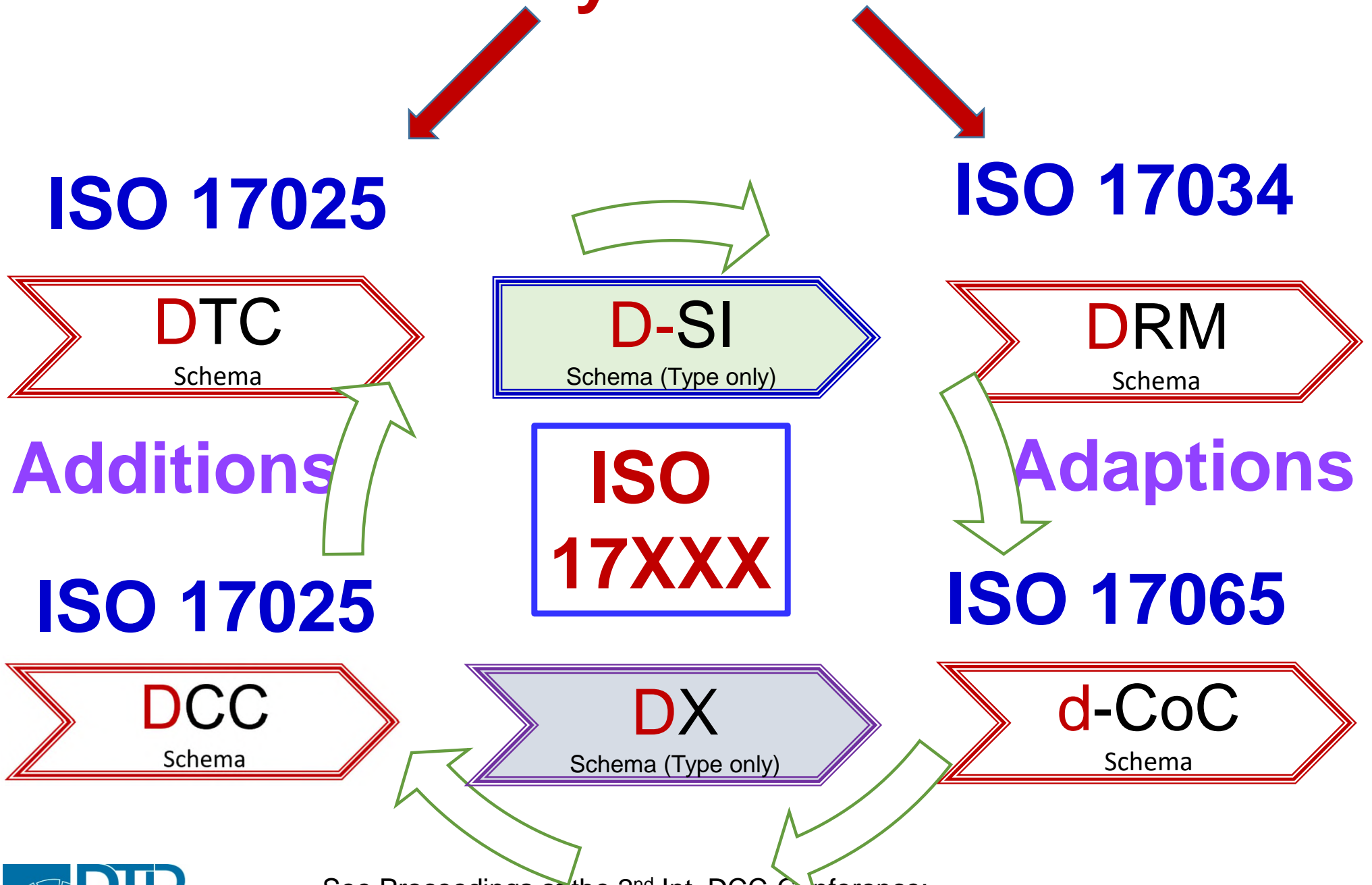


# The DCC-Story

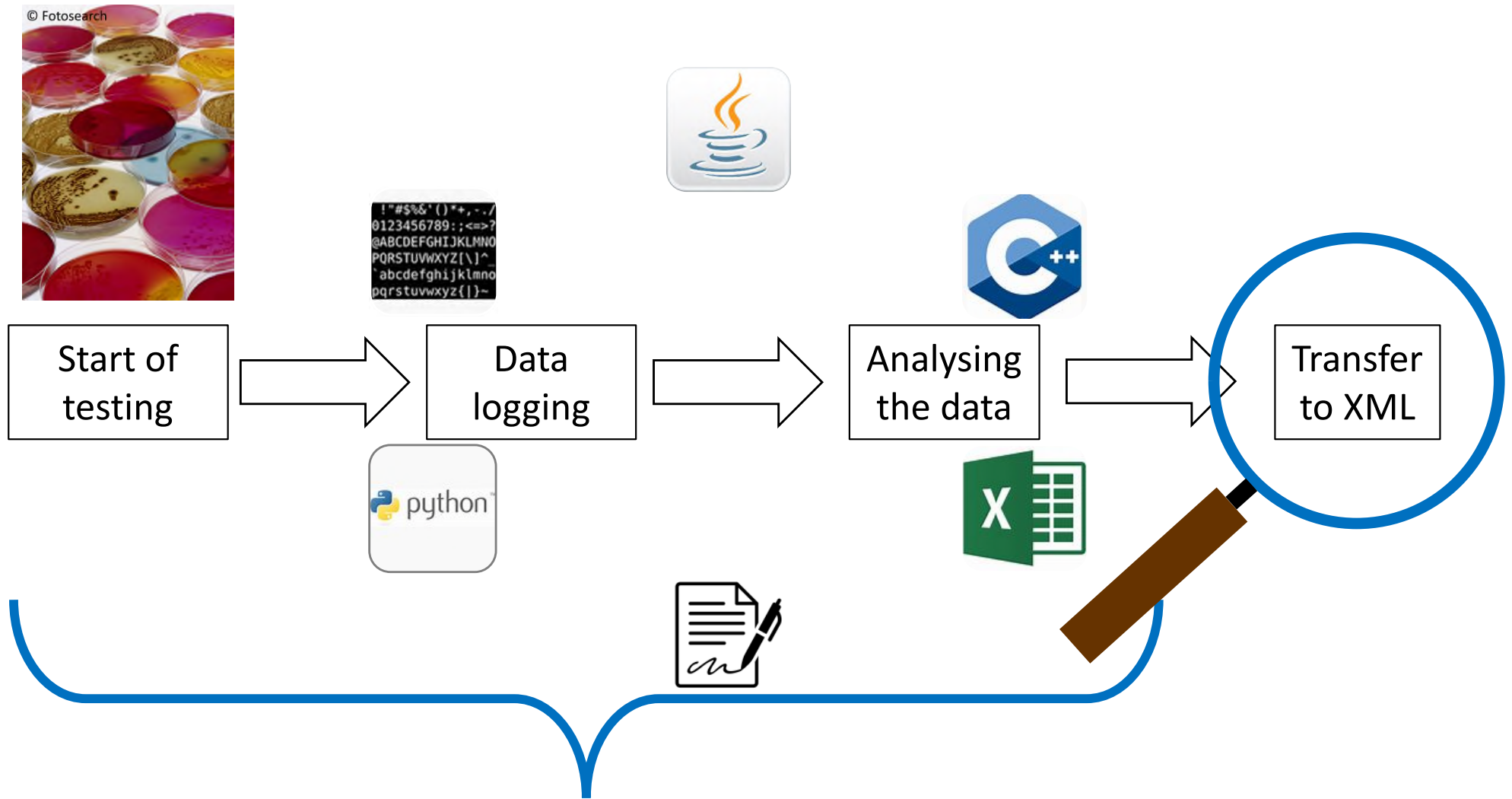
<https://oar.ptb.de/resources/show/10.7795/310.20170403>

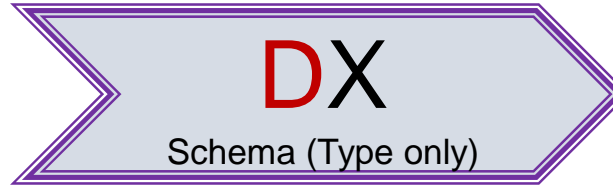


# Not really harmonized...



# Workflow





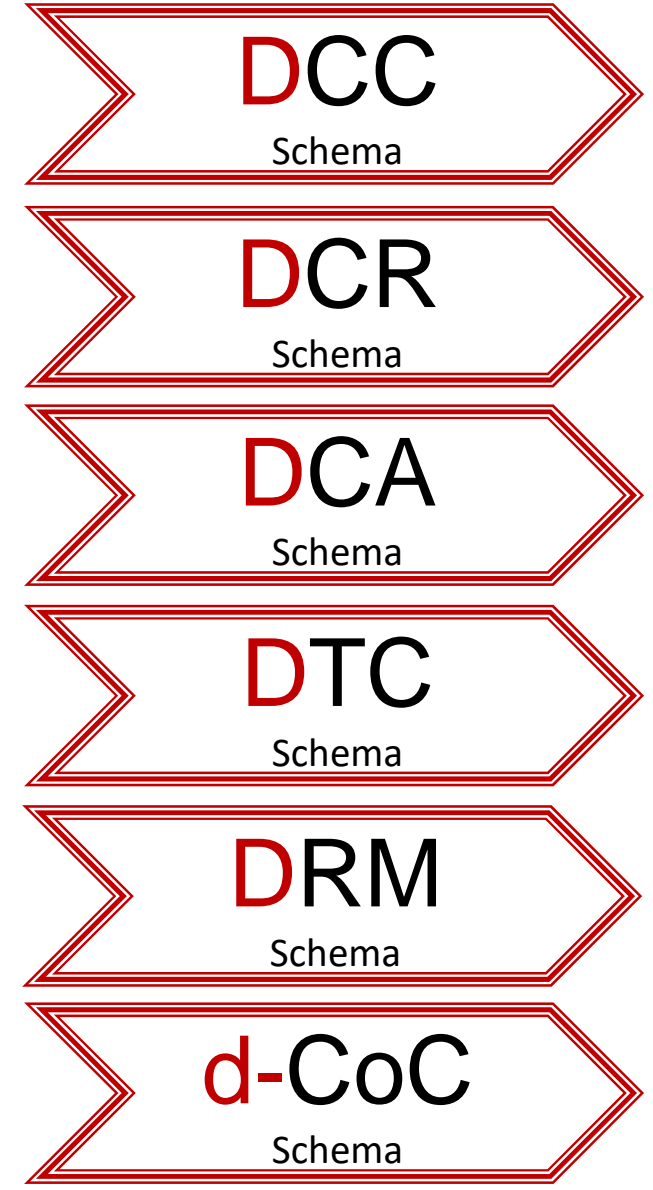
**D**igital Calibration Request

**D**igital Calibration Answer

**D**igital Test Certificate

**D**igital Certificate for Reference Materials

**D**igital Certificate of Conformity





# Digital Test Certificate (DTC)



- Together with the colleagues from the VUP and PTB
- Legionellae etc in water
  - SHAPT
- Battery charger
- Basis:
  - One common language for certificates in metrology
  - DX

# Typical Problems in Digitalization Processes: Comparison of ambient conditions for a mass piece

Lämpötila alussa	24,0 °C	lopussa	24,0 °C
Ilmanpaine	1011 mbar	Kosteus	56 %
Ilman tiheys	1,178 kg/m <sup>3</sup>		

Temperatur Temperature	± ( 21,6 +/-0,2)°C
Relative Feuchte der Luft Relative humidity of air	± ( 51,1 +/-5,0)%
Luftdruck Air pressure	± ( 1012,5 +/-0,1)hPa

	Tlak zraka Air pressure hPa	Temperatura zraka Air temperature °C	Relativna vlažnost zraka Relative humidity of air %RH
Početak umjeravanja	1005,7	20,90	51,3
Kraj umjeravanja	19	21,00	51,2

Temperatura media (Average ambient temperature)	Pressione media (Average atmospheric pressure)	Umidità Relativa media (Average ambient moisture)
(17,8 ± 1,0) °C	(959,5 ± 3,0) hPa	(49,0 ± 4,0) % U.R.

Temperatura otoczenia: (19,8 + 21,9) °C  
Wilgotność: (30,9 + 36,7) %

	von from	bis to	Unsicherheit uncertainty k = 2
Temperatur / °C temperature	21,57	21,57	0,20
rel. Luftfeuchte / % relative humidity	45,3	45,6	2,0
Luftdruck / mbar air pressure	994,90	995,50	0,20

	from von	up to bis	Measurement uncertainty Messunsicherheit U(k=2)	
Temperatur temperature	21,64	- 22,65	0,10	°C
Rel. Luftfeuchtigkeit rel. humidity	44,0	- 46,1	1,5	%
Luftdruck Air pressure	966,7	- 990,6	0,2	mbar

Zum Zeitpunkt der Kalibrierung betrug die mittlere Luftdichte  $\rho_l = 1,17 \text{ kg m}^{-3}$ .  
Sie wurde mit einer erweiterten Messunsicherheit von  $0,03 \text{ kg m}^{-3}$  berechnet.

gewicht in lucht van  $1,2 \text{ kg/m}^3$  in evenwicht is. De omgevings-  
temperatuur tijdens de kalibratie bedroeg  $(20 \pm 5)^\circ\text{C}$ .



Snapshots taken from the presentation of Julian Haller (Sartorius), held on the 42th AWA-PTB-Talk, 2022-05-09

## 1.: Administrative Data

- regulated

## 2.: Results of the Calibration

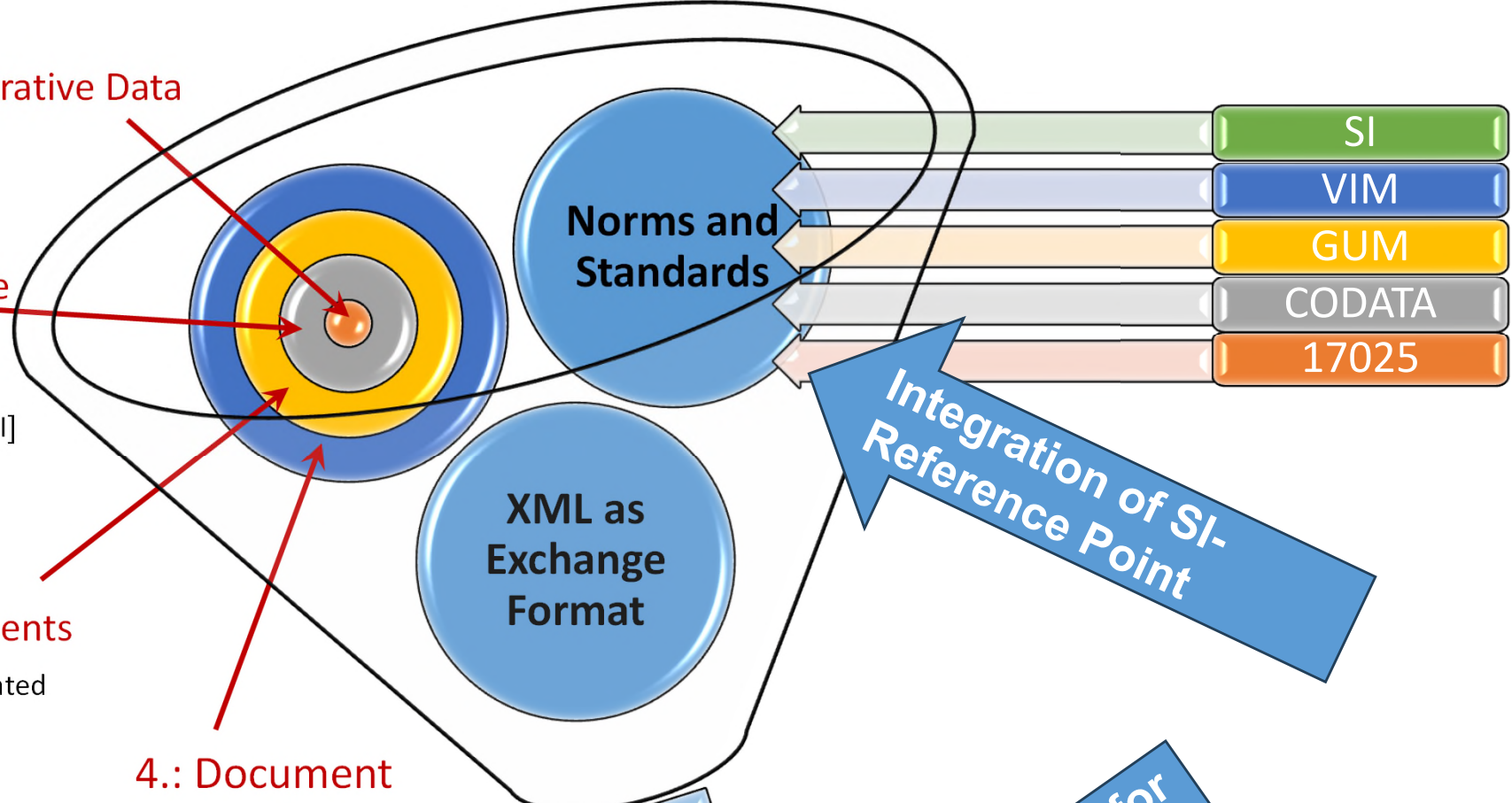
- regulated:
  - $Y = y \ U(k) \ [SI]$
- not regulated:
  - individual data
  - ...

## 3.: Comments

- not regulated

## 4.: Document

- human readable



DX-Language for DTC, DRM, ...

Formulas for Execution

Say what You want!

Precise calculus with the help of DCC and DCC-Tools out Of the DCC-Toolbox







©: www.fotalia.de

<https://www.youtube.com/watch?v=xEE7Mv5s0es>

## Physikalisch-Technische Bundesanstalt Braunschweig und Berlin

Bundesallee 100  
38116 Braunschweig  
Germany

More questions? Please contact:

Dir. u. Prof. Dr. Siegfried Hackel

Phone: +49 531 592-1017

E-Mail: [siegfried.hackel@ptb.de](mailto:siegfried.hackel@ptb.de) [www.ptb.de/dcc](http://www.ptb.de/dcc)

2024-06-18

