

BIM in Tunneling

Webinar – March 18, 2021



DAUB recommendation on “BIM in Tunnelling”

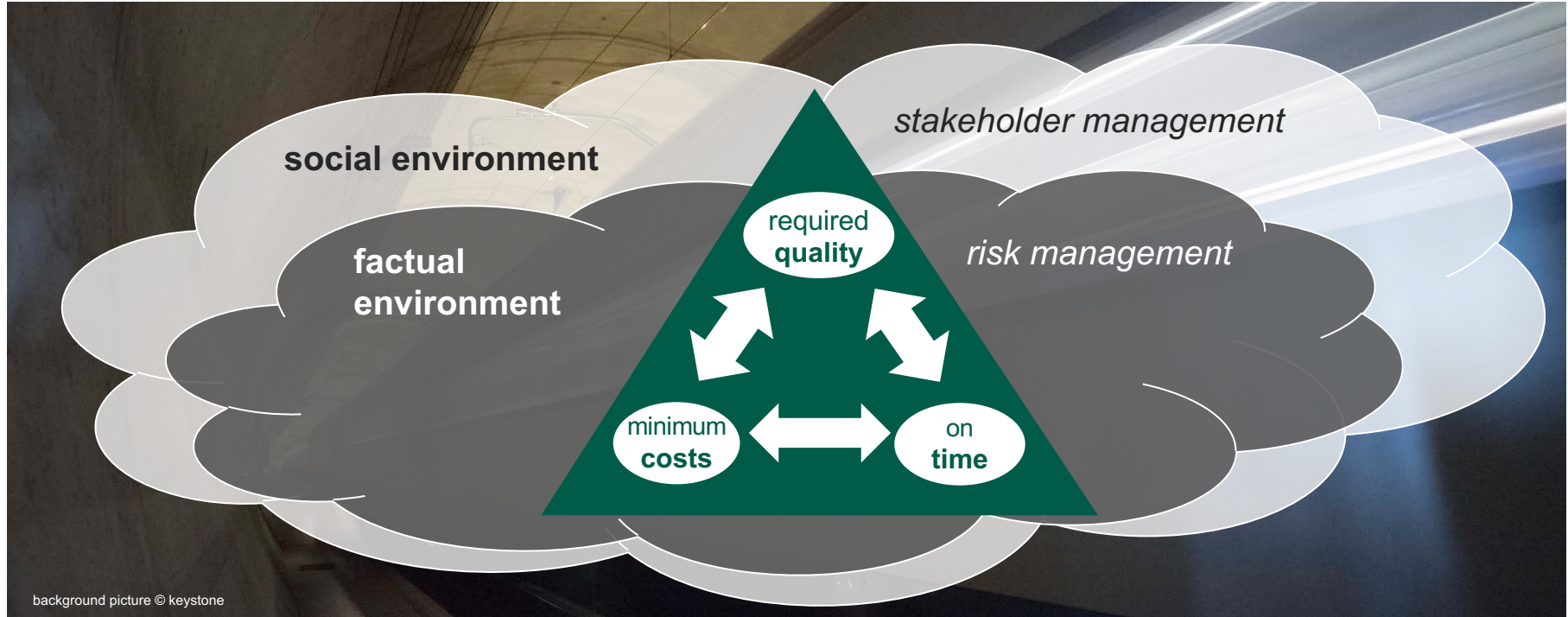
Heinz Ehrbar

Head DAUB-steering committee BIM

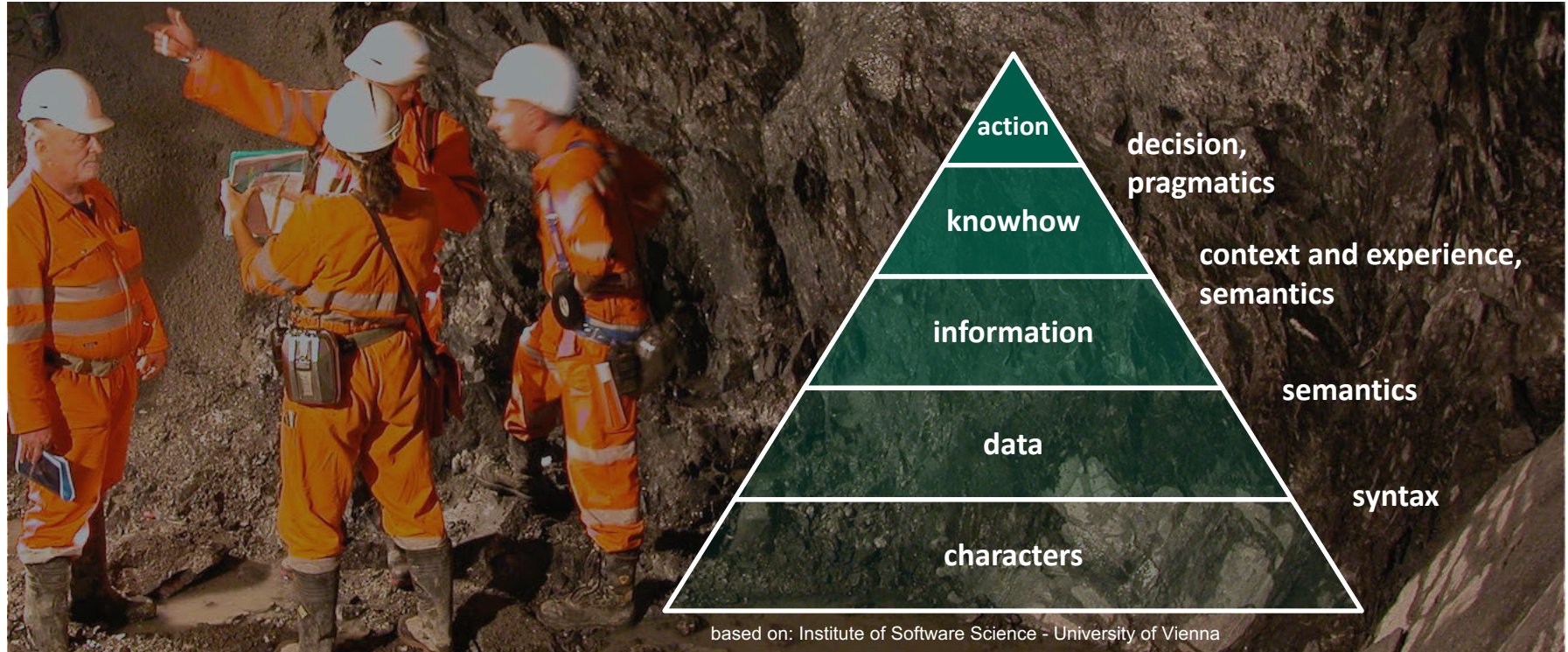


Our vision

Infrastructure projects are not an end in itself;
they have to fulfil a large set of requirements in a complex
environment



Underground construction requires ongoing decisions;
Decisions have to be taken based on information and knowhow



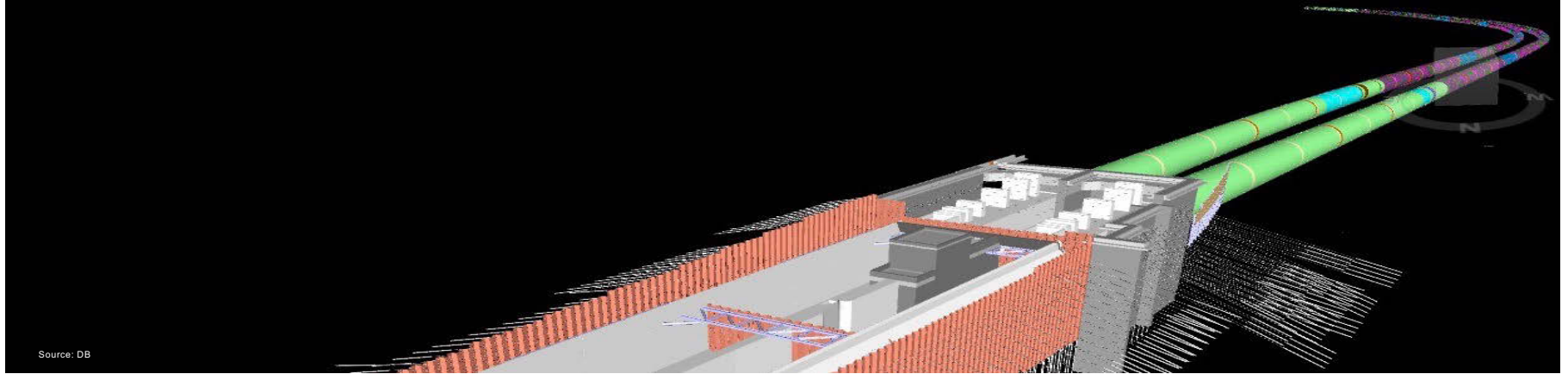
based on: Institute of Software Science - University of Vienna

Our vision: Our digital tools provide us with the latest experience and knowledge anywhere and at any time so that we can make our decisions.



Source: Amberg Engineering

Objectives when using digital methods



Initiation

Design

Proc.

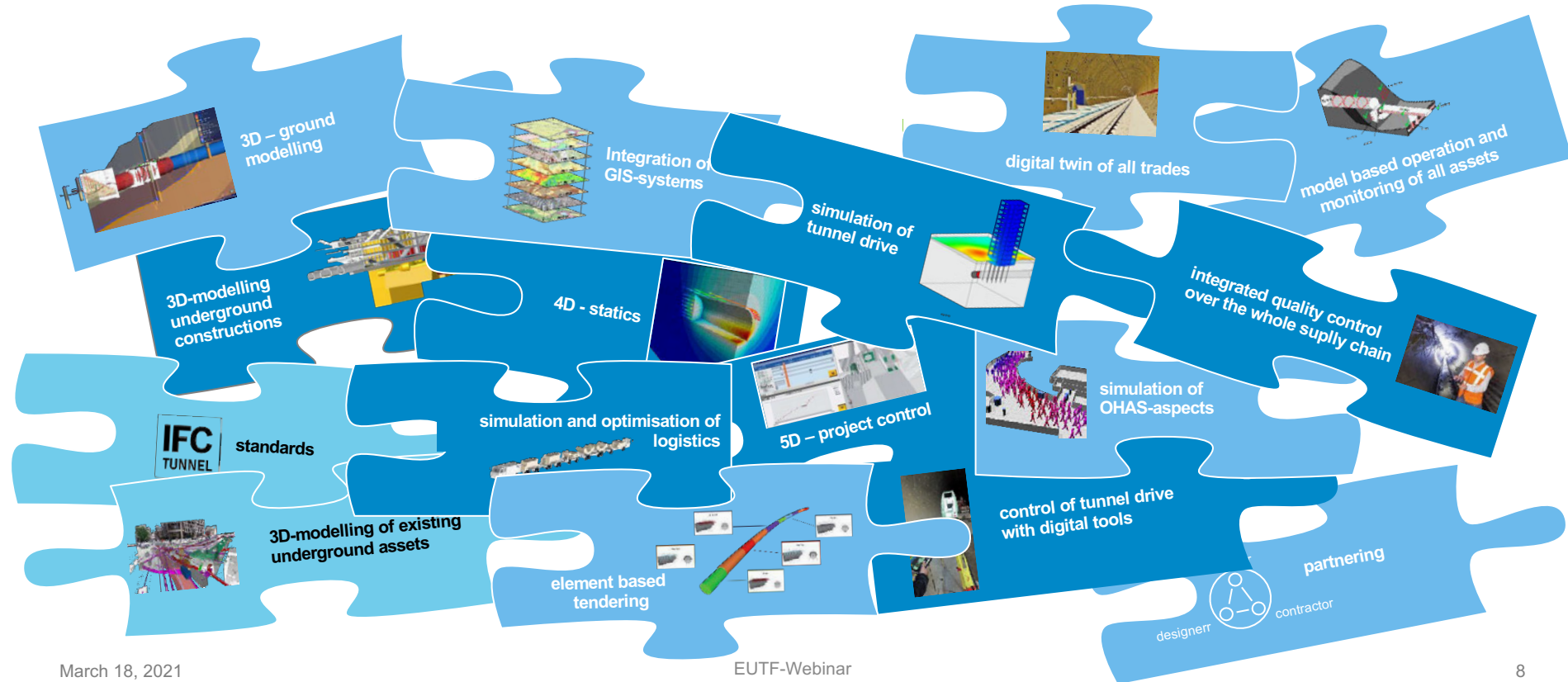
Construction

Use

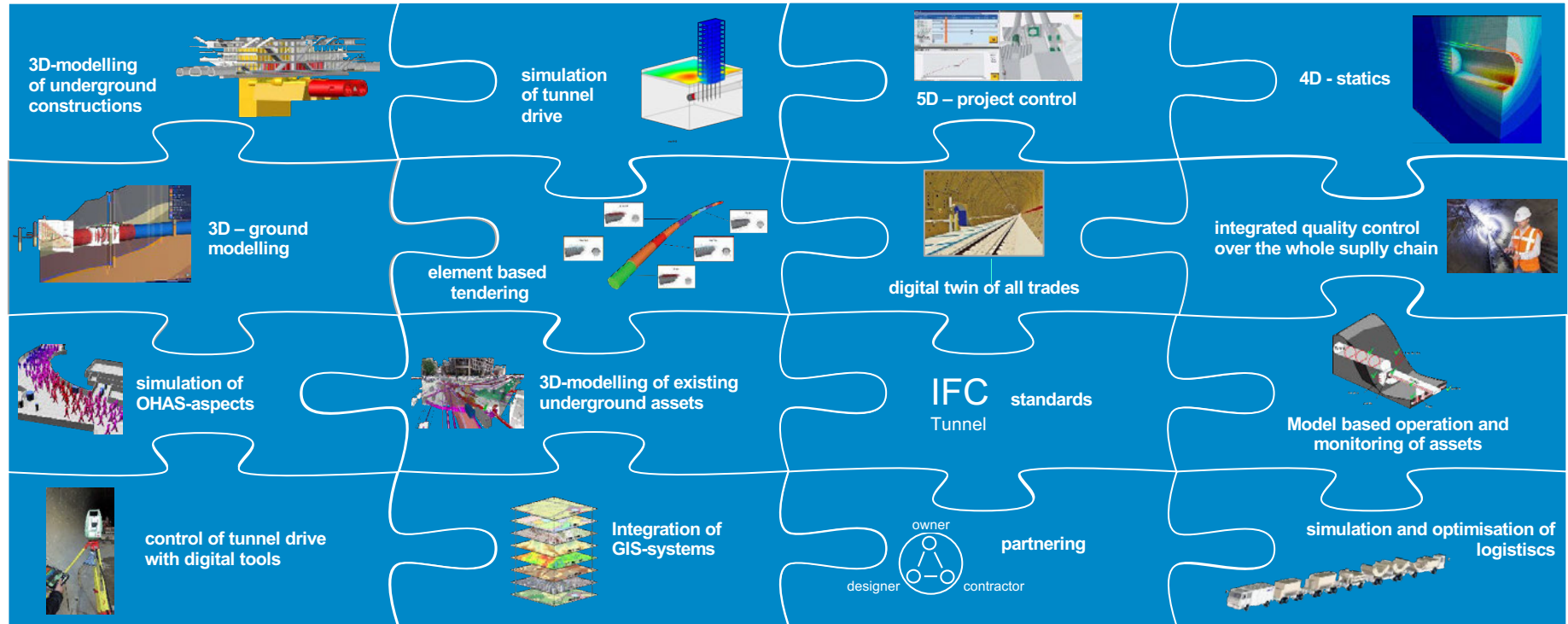
**End
of
life**

continuous, lossless, machine readable data flow

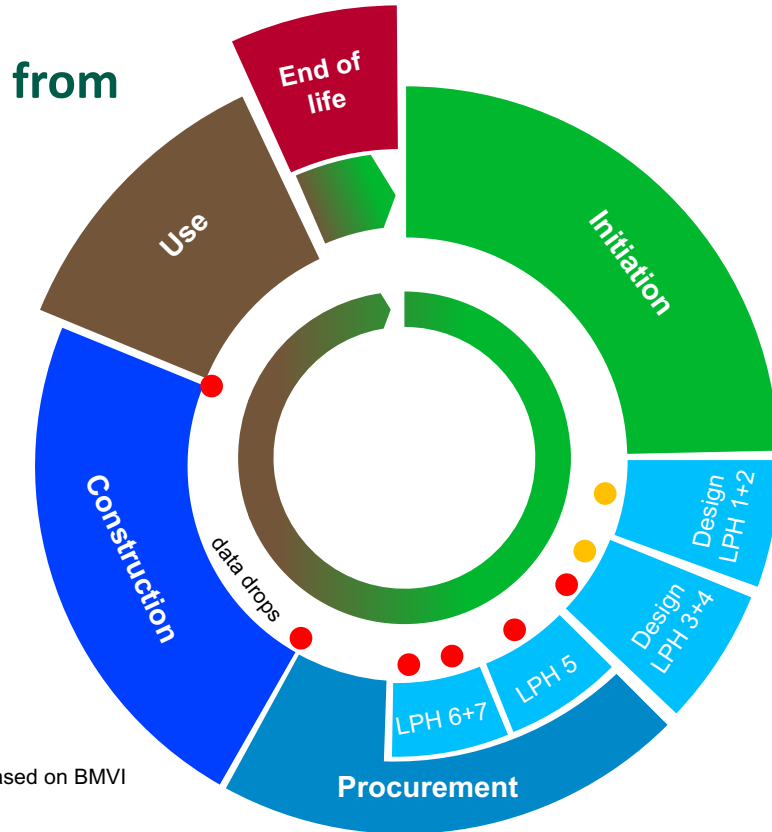
Actual situation: Many parts of the puzzle are available with different degrees of maturity



Our Vision: By the year 2025, we own all puzzle pieces and we put them together in order to form a coherent overall picture

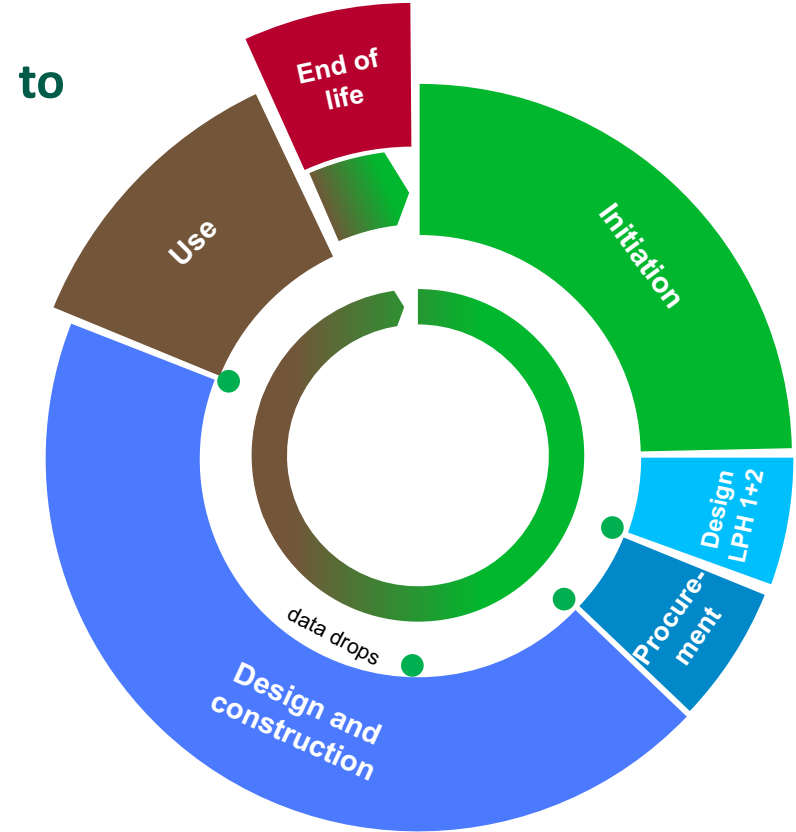


Our Vision: reduction of number of data drops thanks to a new type of collaboration



based on BMVI

March 18, 2021



EUTF-Webinar

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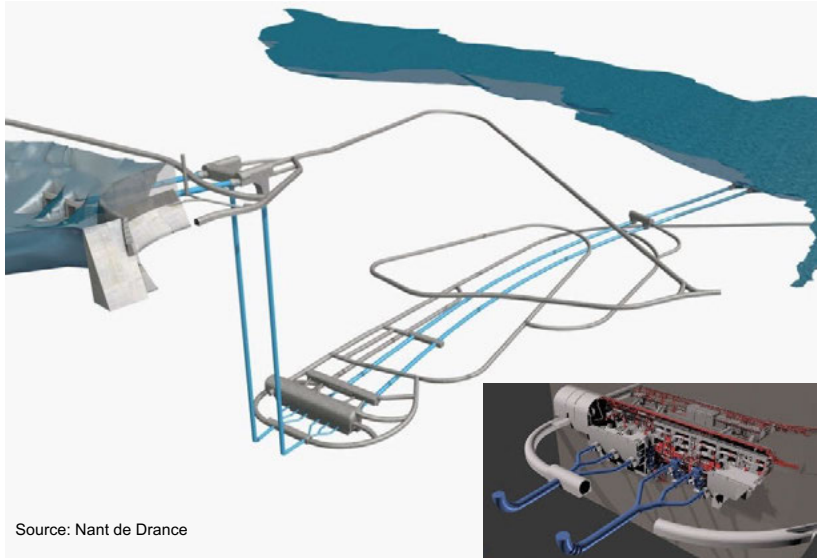
Deutscher Ausschuss für
unterirdisches Bauen
German Tunnelling Committee

Our challenges



Special features of underground construction

Generally high geometrical complexity



Source: Nant de Drance

The ground is our main construction material with all its uncertainties



Source: Golder Ass. / Tunneltalk

Today's challenge: the data overload creation of useful information based on relevant data

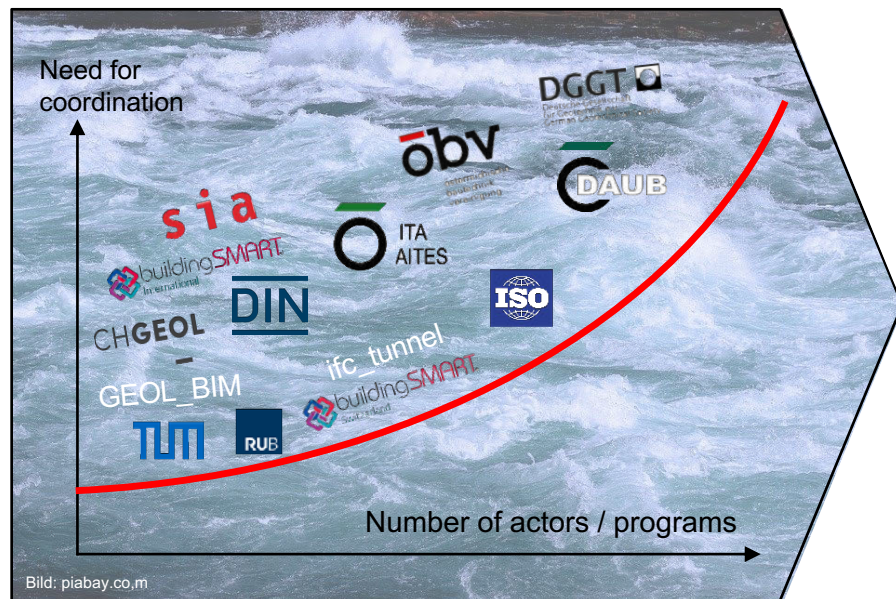


We need rules on many levels in order to avoid the data overload

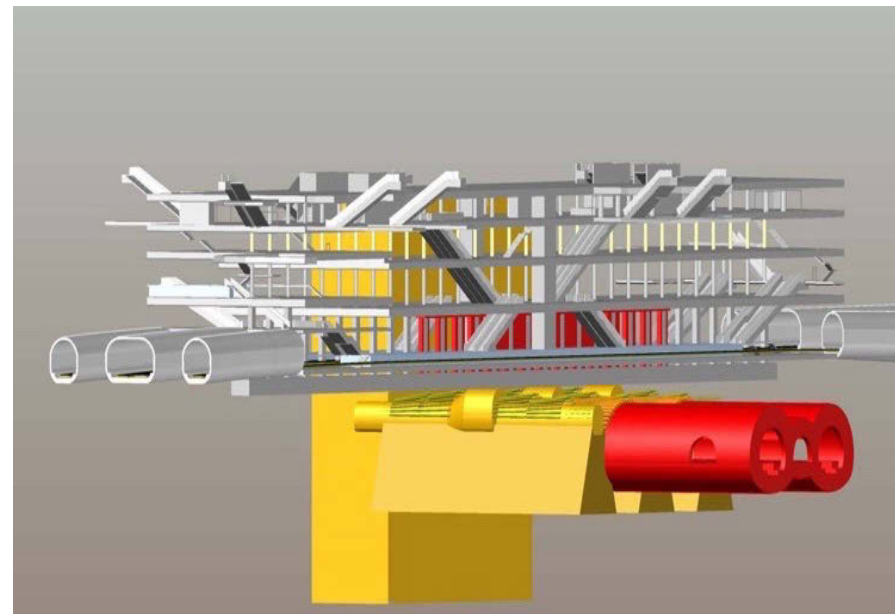


Understanding of our role

There are many activities on BIM in parallel



We take on a leading role to develop solutions for the digitization of underground construction





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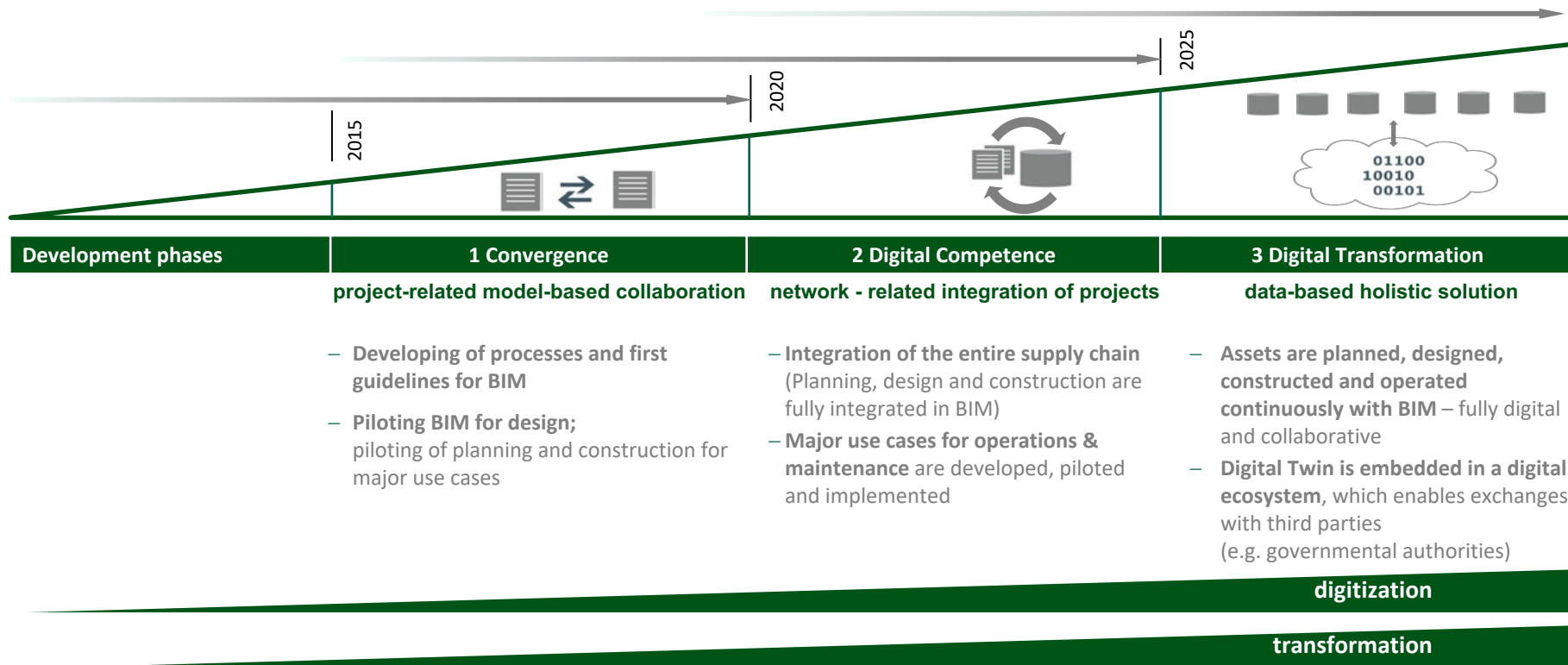


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Our strategy



Our strategy: Implementation three major steps



Fields of action in our Strategy



- 1 **Strategy**
 - clear definition of the ideal typical final state
 - measurable milestones
- 2 **People**
 - team based collaboration – no silos anymore
 - Involve the team / reduce fear / training and education
- 3 **Information/Data**
 - Data architecture based on supplier independent interfaces
 - Standardized object and element libraries
- 4 **Processes**
 - define customized / new processes - get easier
 - clearly define new roles and responsibilities
- 5 **Infrastructure IT**
 - Software/services follow the increasing requirements
 - Common Data Environment on a safe cloud environment
- 6 **Application**
 - Application in projects and in test use cases - do it!
 - Integrate end-user requirements



The DAUB recommendation (May 2019)

DAUB recommendation on “BIM in Tunnelling” (May 2019)



Preamble

- 1 General constraints
- 2 BIM basics
- 3 Design preparation
- 4 Design
- 5 Construction preparation
- 6 Construction
- 7 Operation

8 Outlook

- 9 Glossary
 - 10 References
- Appendix 1
- Appendix 2

The following **fields of action should be given priority** for a beneficial application of BIM in underground construction

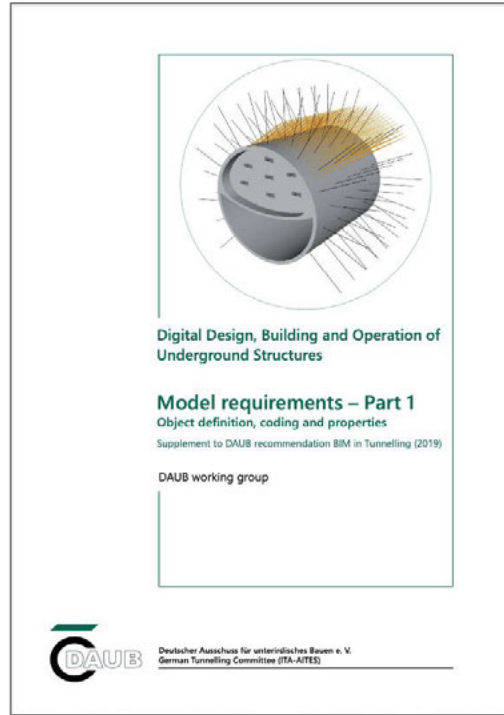
- **Standardisation of ground modelling**
- **Standard catalogue of components for underground construction**
- **Soft- and hardware (modelling, project management (CDE))**
- Conditions of contract (collaborative partnership)
- Contract award practice
- Training for young professionals and users

available in

- english
- german
- spanish (near future)

[http://www.daub-ita.de/fileadmin/documents/daub/gtcrec4/gtcrec11 Recommendation BIM in Tunnelling 05-2019 .pdf](http://www.daub-ita.de/fileadmin/documents/daub/gtcrec4/gtcrec11_Recommendation_BIM_in_Tunnelling_05-2019_.pdf)

Additional document (October 2020): Model requirements - part 1; Object definition coding and properties



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available in english and german

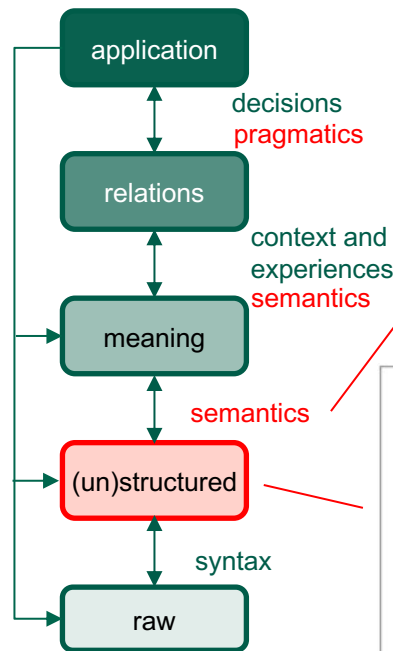
[https://www.daub-ita.de/fileadmin/documents/daub/gtcrec4/2020-11 DAUB BIM im Untertagebau Modellanforderungen T1 en.pdf](https://www.daub-ita.de/fileadmin/documents/daub/gtcrec4/2020-11_Daub_BIM_im_Untertagebau_Modellanforderungen_T1_en.pdf)

Joint activities of DAUB, ITA-Austria, STS

Work in Progress: three additional recommendations

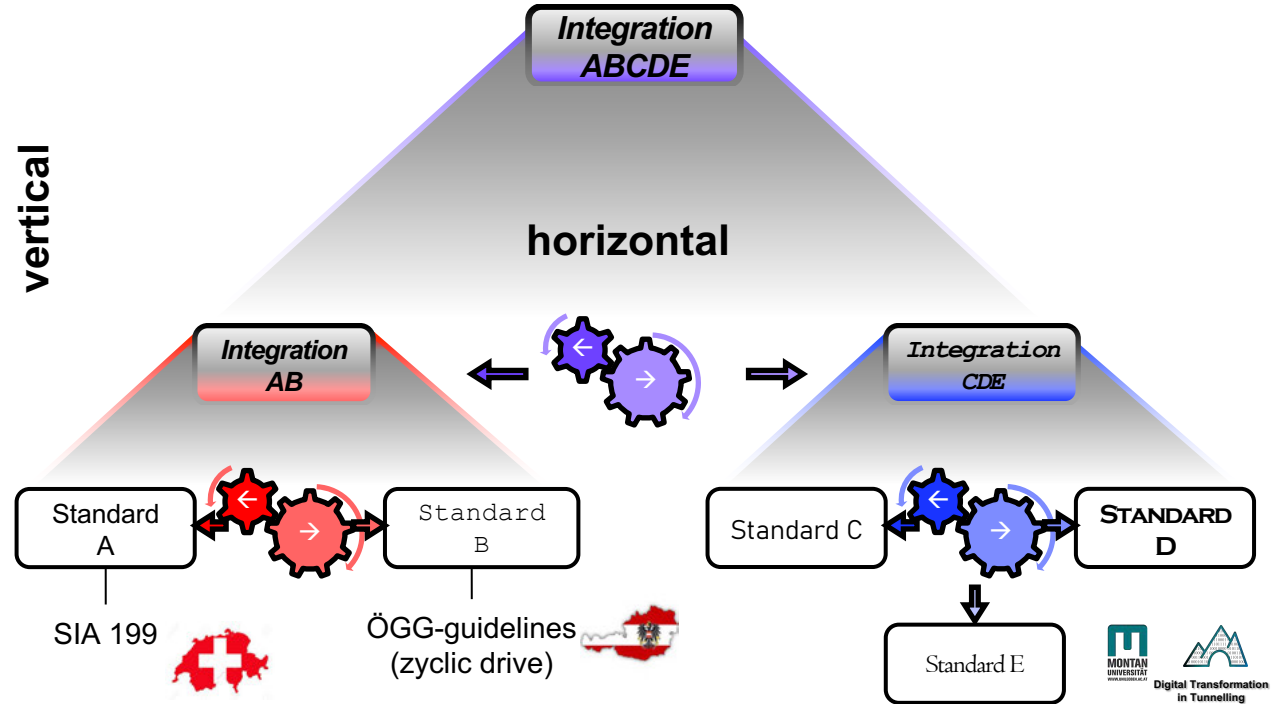
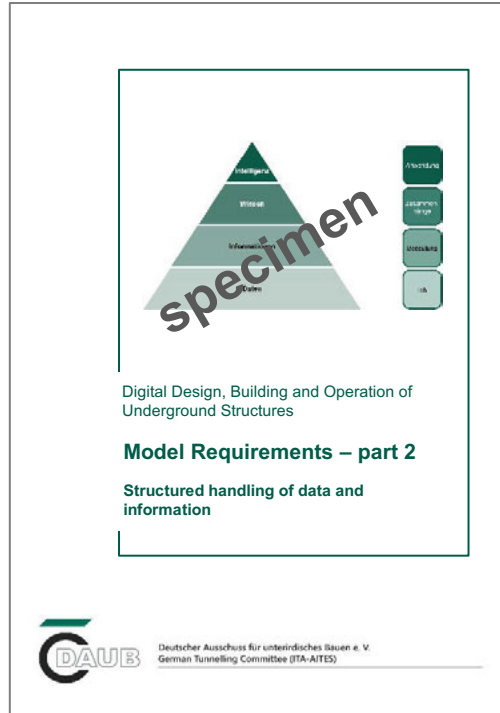


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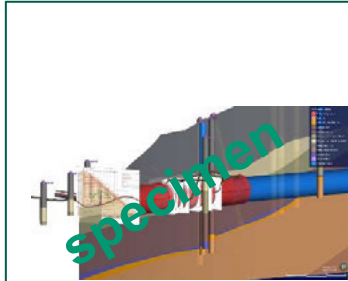
Work in Progress: Model Requirements – part 2

Structured handling of data and information



Work in Progress: Model Requirements – part 3

Recommendation on digital ground modelling

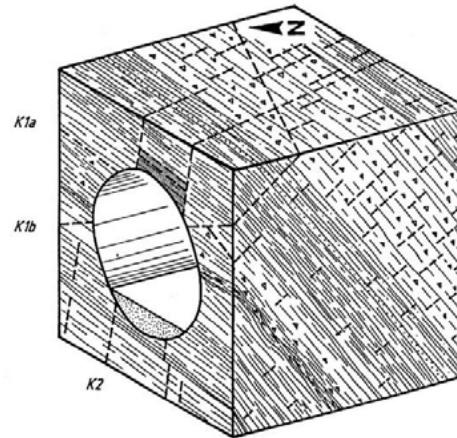


Digital Design, Building and Operation of
Underground Structures

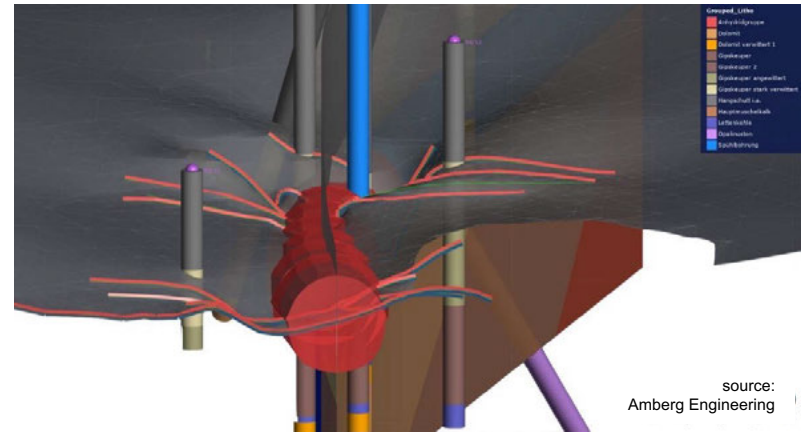
Model Requirements – part 3

Recommendation on
digital ground modelling

from

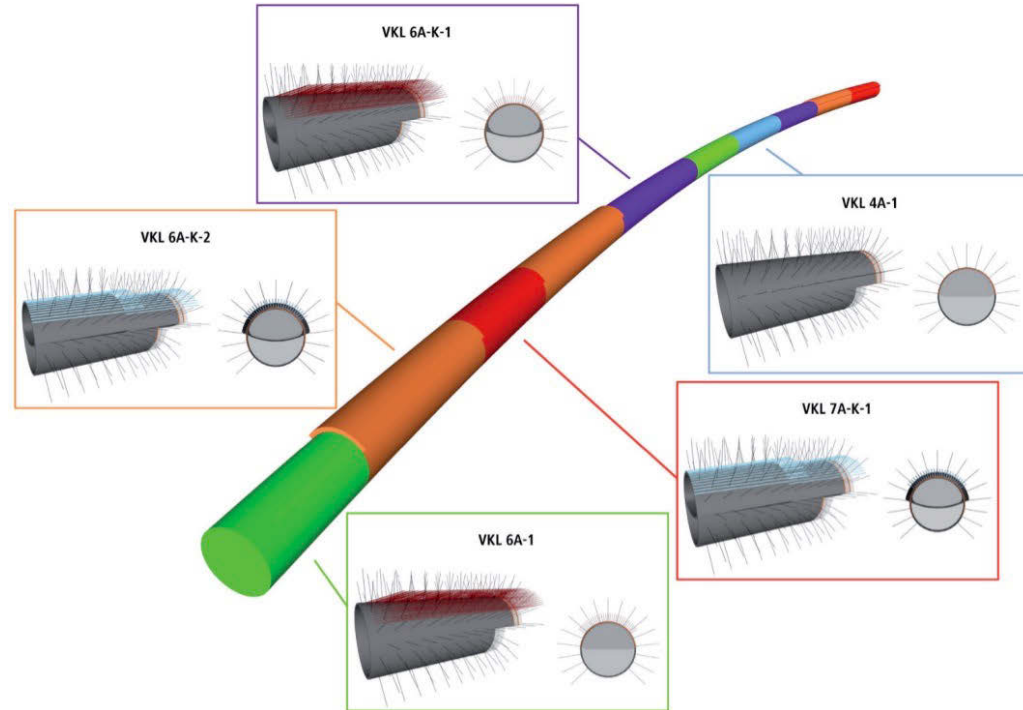
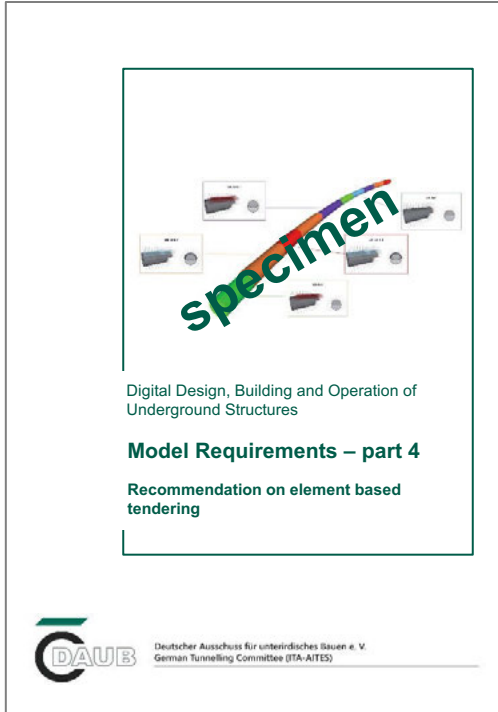


to



Work in progress - Model Requirements – part 4

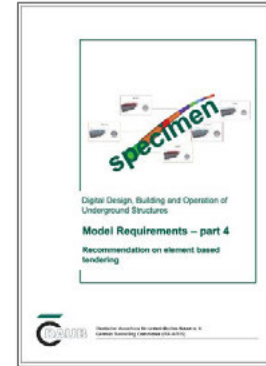
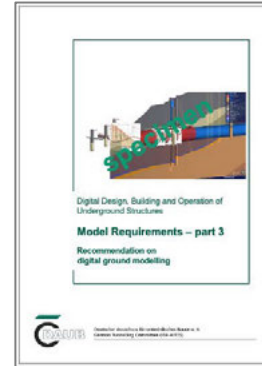
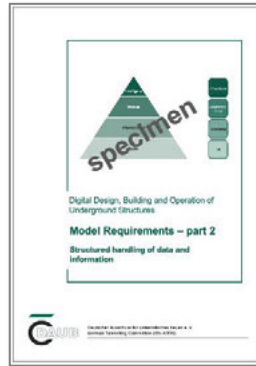
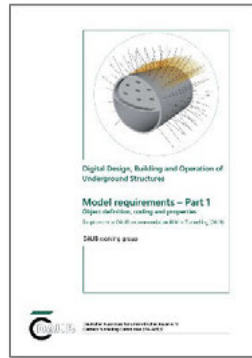
Recommendation on element based tendering





Outlook

Summary



...

published



We work hard that the digital twin in tunnelling becomes soon reality

real tunnel



digital twin tunnel



Next steps: the latest during the WTC 2022



ITA-AITES
WTC2022
22-28 APRIL 2022 Copenhagen

Until then we expect challenging dialogues!

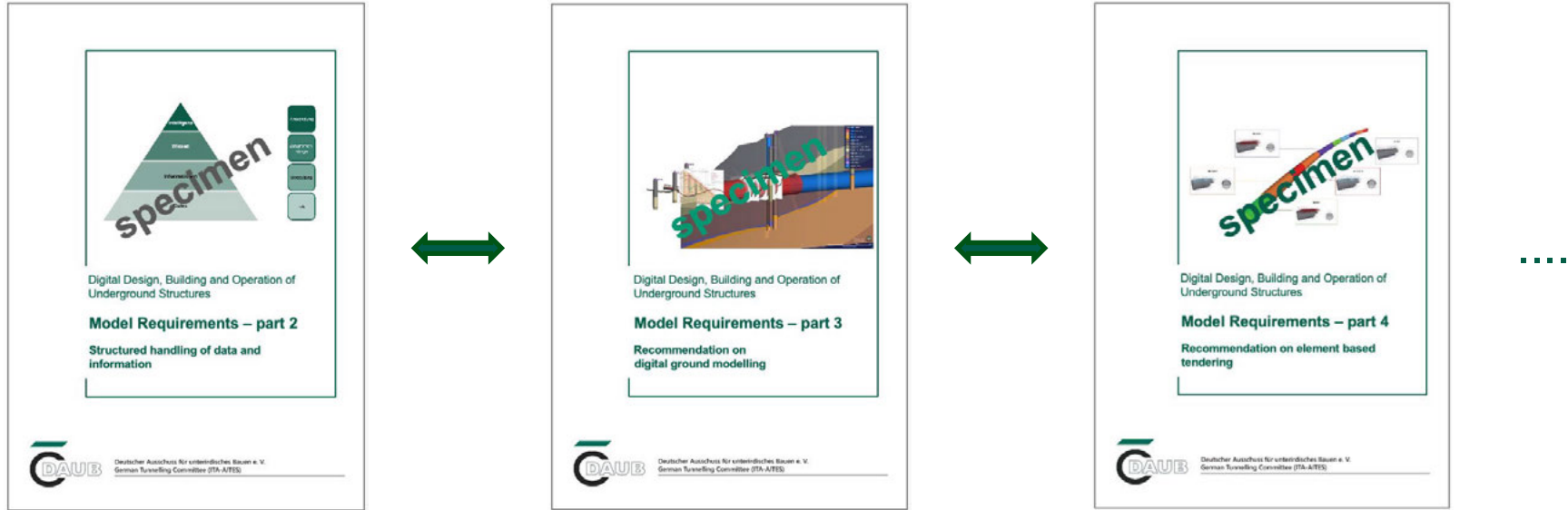
We hope to meet you there!



Thank you for your attention

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Work in Progress: three additional recommendations



Three linked recommendations.

The overall document structure allows to expanded in order to meet future requirements