Leibniz ScienceCampus
Digital Transformation of Research

Leibniz Science Campus Digital Transformation of Research

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fPET Conference
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FIZ Karlsruhe
Leibniz Institute for Information Infrastructure

Karlsruhe Institute of Technology

gefördert durch
Leibniz-Wettbewerb

Beyond data

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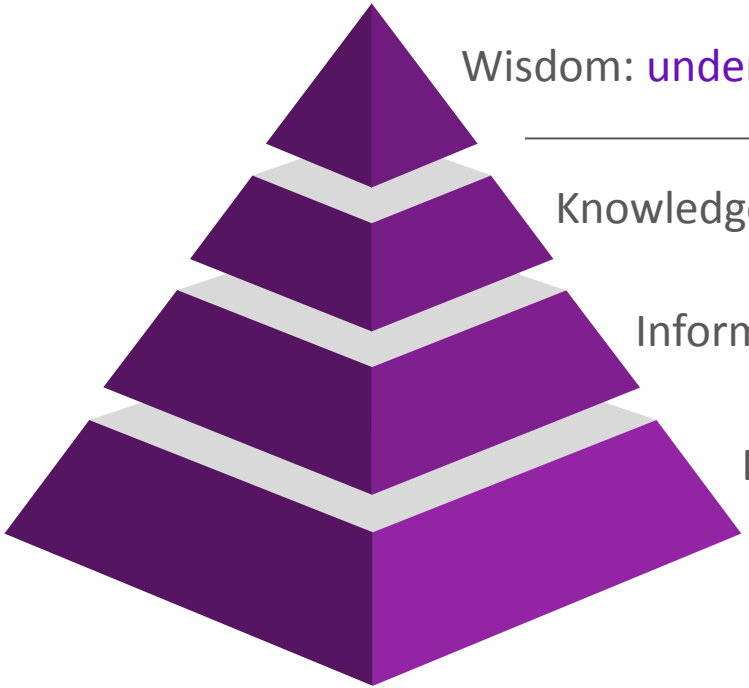

Wisdom: understanding (why?)

Knowledge: context (how?)

Information: meaning (what?)

Data: raw (characters, symbols)

future
novelty

past
experience

DIKW pyramid, Ackoff 1989

Beyond data

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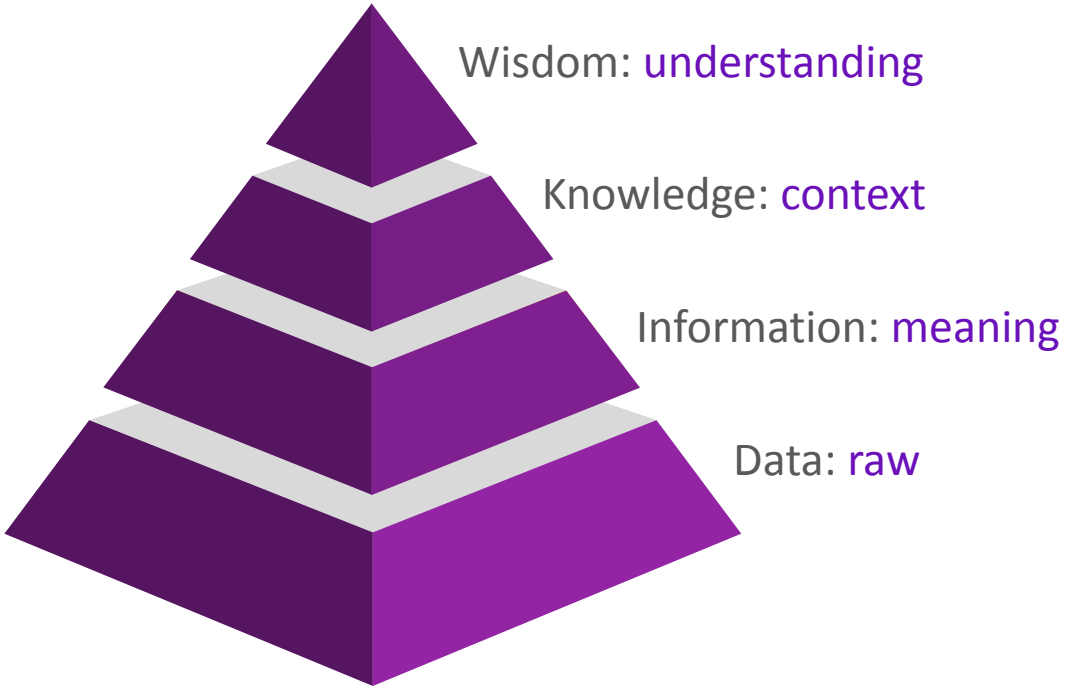

DIKW pyramid, Ackoff 1989

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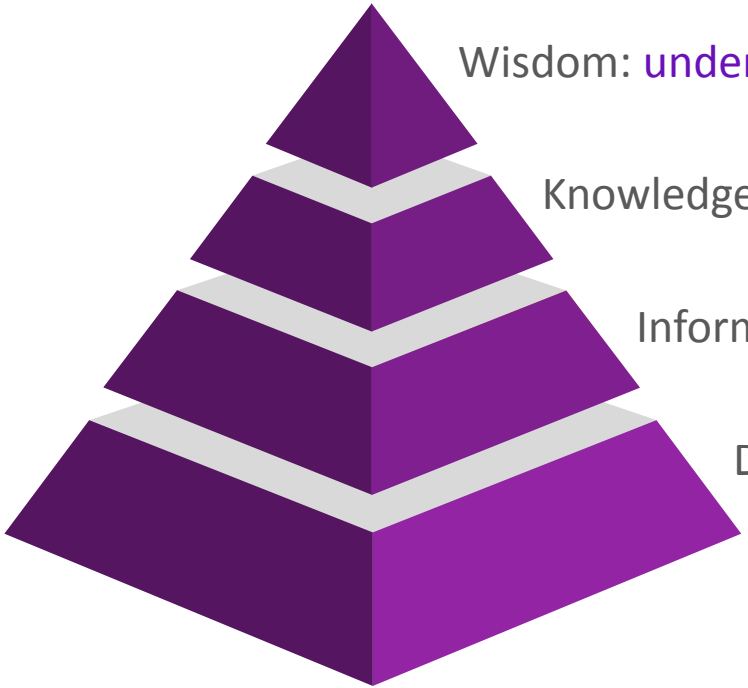

DIKW pyramid, Ackoff 1989

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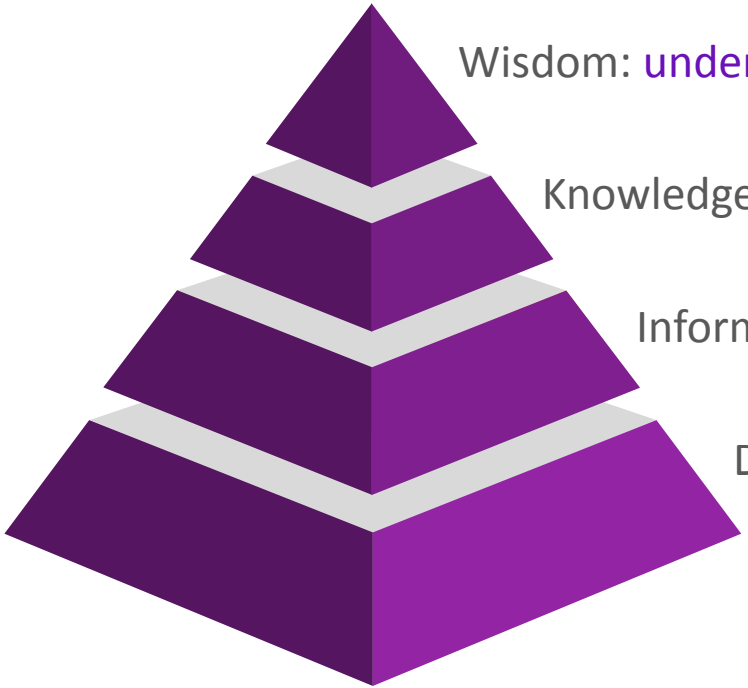
what to collect



contemplation

cognition

convention

DIKW pyramid, Ackoff 1989

‘Datafication’ and digitalisation

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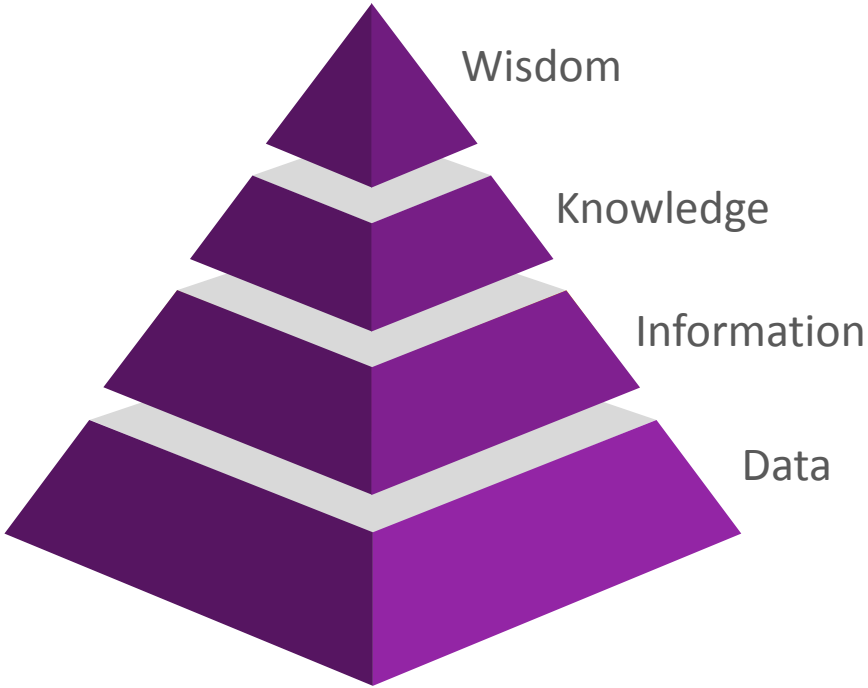

DIKW pyramid, Ackoff 1989

- Digitisation: data into digital form
- Digitalisation: digitisation of processes
- Digital transformation: fundamental changes in the system

Data-driven processes include and influence both academia and society.

DiTraRe: improve the whole cycle

DiTraRe

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- Digitisation
  I.e. data preservation (analog more stable)
  Challenge: large datasets in climate research
- Digitalisation
  I.e. automatisation (reducing the need for human intervention)
  Challenge: multi-level processes in chemistry labs
- Digital transformation
  I.e. influence of AI on the whole process
  Challenge: how crucial is AI?
- Societal impact
  I.e. trustworthiness in results based on AI
  Challenge: heart simulations

DiTraRe Use Cases

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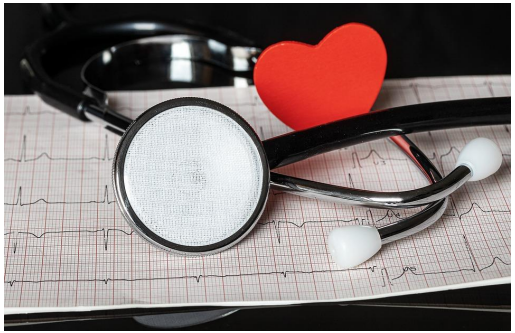
Sensitive data in sports science

KIT Institute of Sports and Sports Research



AI in biomedical engineering

KIT Institute of Biomedical Engineering

Chemotion Electronic Lab Notebook

KIT Institute of Biological and Chemical Systems

Publication of large datasets

KIT Institute of Meteorology and Climate Research

From Use Cases to Research Clusters

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Use cases

- Impact of digitalisation and AI on science
- Impact of digitalisation and AI on reception of science in society
- Overarching challenges of a technical, legal and ethical nature
- Specific requirements from research (use cases) in the digitalisation and application of AI

From Use Cases to Research Clusters

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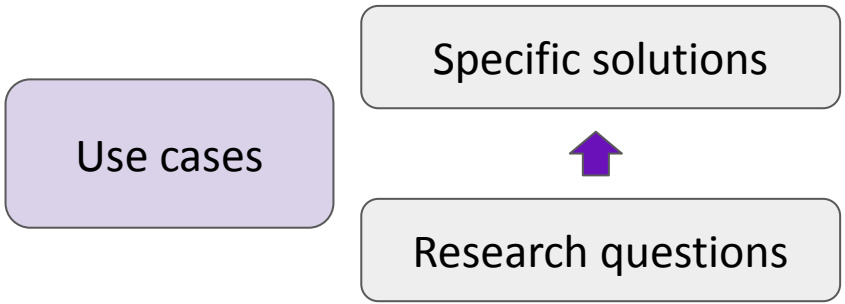

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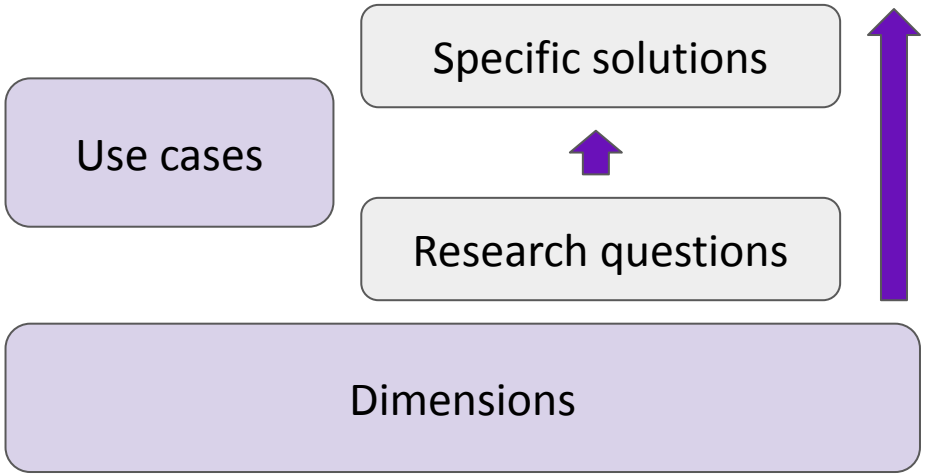

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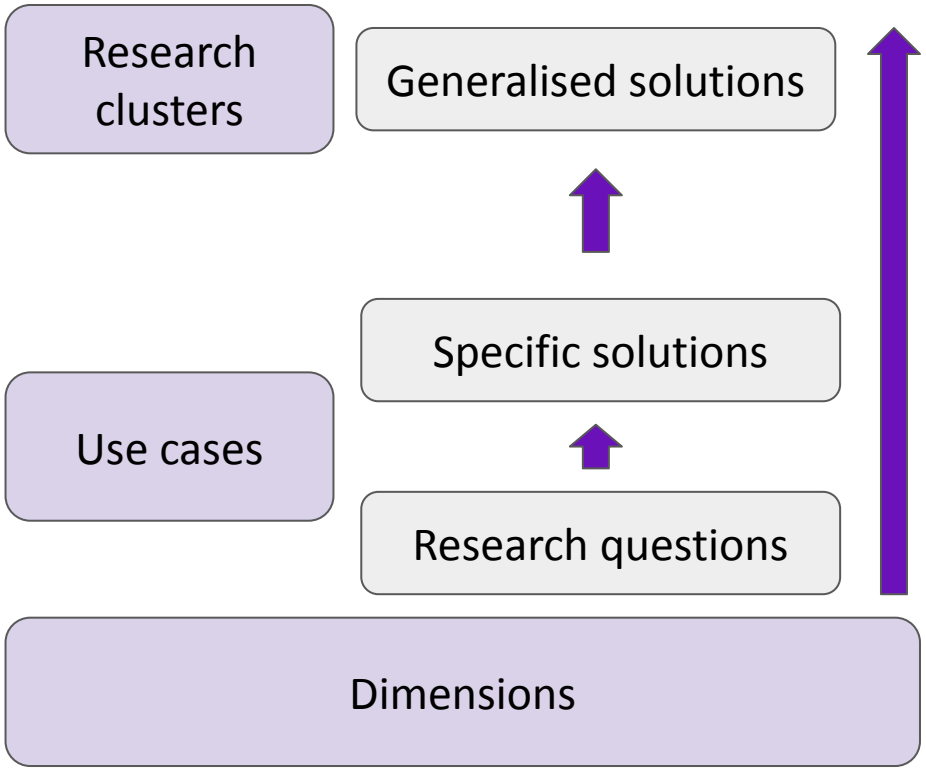

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DiTraRe dimensions

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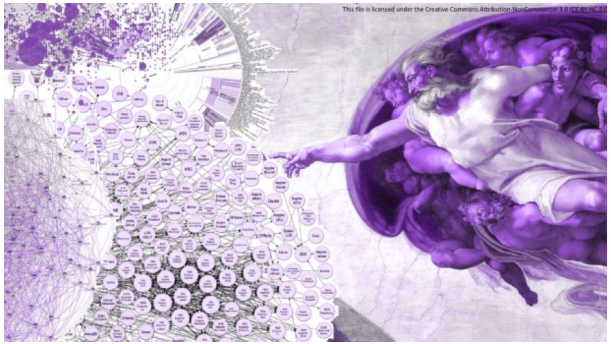

- Exploration and knowledge organisation
  applied AI: represent, organise, and manage domain specific and procedural knowledge
- Legal and ethical challenges
  data ethics, data protection, copyright and data law
- Tools and processes
  digital tools tailored precisely to the needs of researchers
- Reflection and resonance
  a dialog between research and society, interactive process

Planned outcomes

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- Specific solutions to use cases problems
- Generalised solutions, i.e. best practices, esp. in ethical, legal, security context
- Intensify interactions with society
- Identify new potential threats which come with digitalisation
- Spin-off projects
- Create a networking environment: **collaborate with others**!

Summary

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1. DiTraRe - broad topic: we start with specific UCs
2. Interdisciplinary: many perspectives
3. Role of AI: brings another level
4. What does digitalisation do with humans and how can this be moderated by them?

For more details take a look at my **poster AI4DiTraRe**!

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Thank you for your attention!

Generalisation

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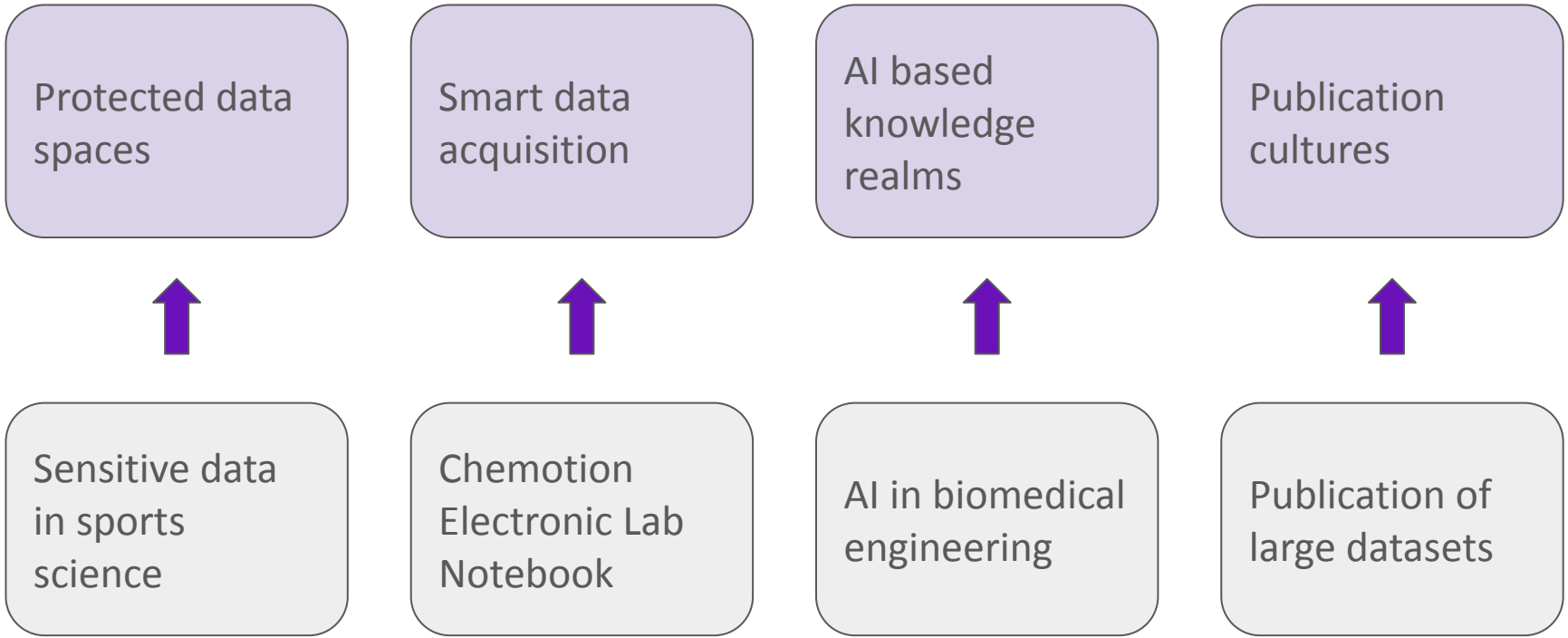

What if…

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- …there is something “outside” of data that we’re missing?
- What are the research questions “outside” of data?
- Are we going to be only about data now?
- What to do with existing methods to make sure we don’t lose a broad perspective?
- Seeing through the glasses of AI do we grasp more or less of the real world?

Internal: comments from reviewers

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Review #1:
The abstract reads more like advertising for a research project in which several buzzwords are used. The project seems very far-reaching indeed and I lack an imagination of how the variety of topics mentioned in this abstract could be meaningfully spanned in a short paper presentation.

Review #2:
To learn about the Leibniz ScienceCampus will be interesting to conference attendees. In the abstract some points remain unclear. What are "practical solutions" (1st paragraph) developed for? Why are the four dimensions not explicitly named? The structure of the presentation will be vital for the audience to grasp what is investigated at the new Campus.

Abstract here