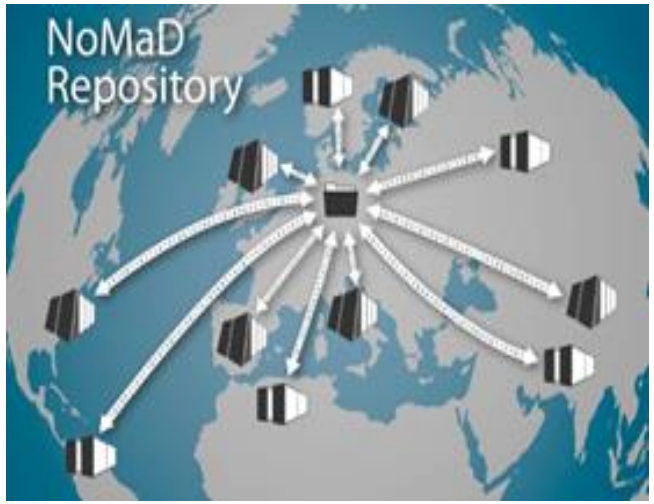
To Become Fit for the IoT Data Game Change

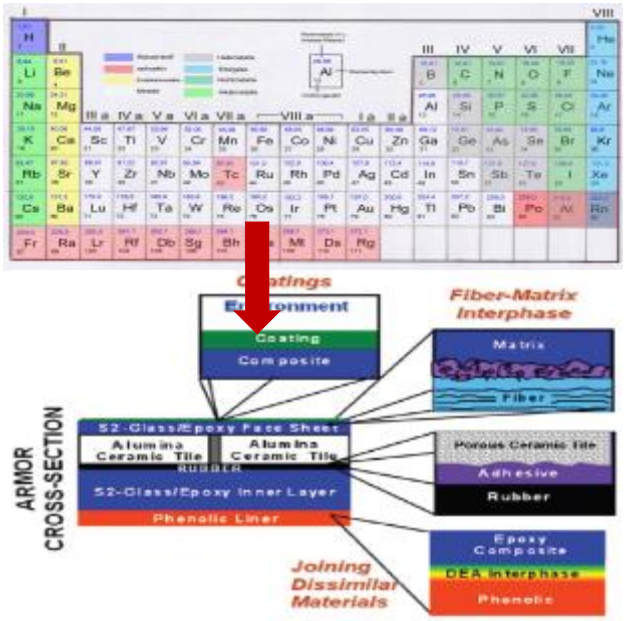
Peter Wittenburg

Max Planck Society, Max Planck Computing & Data Facility

RDA Europe Director

NoMaD - Material Science





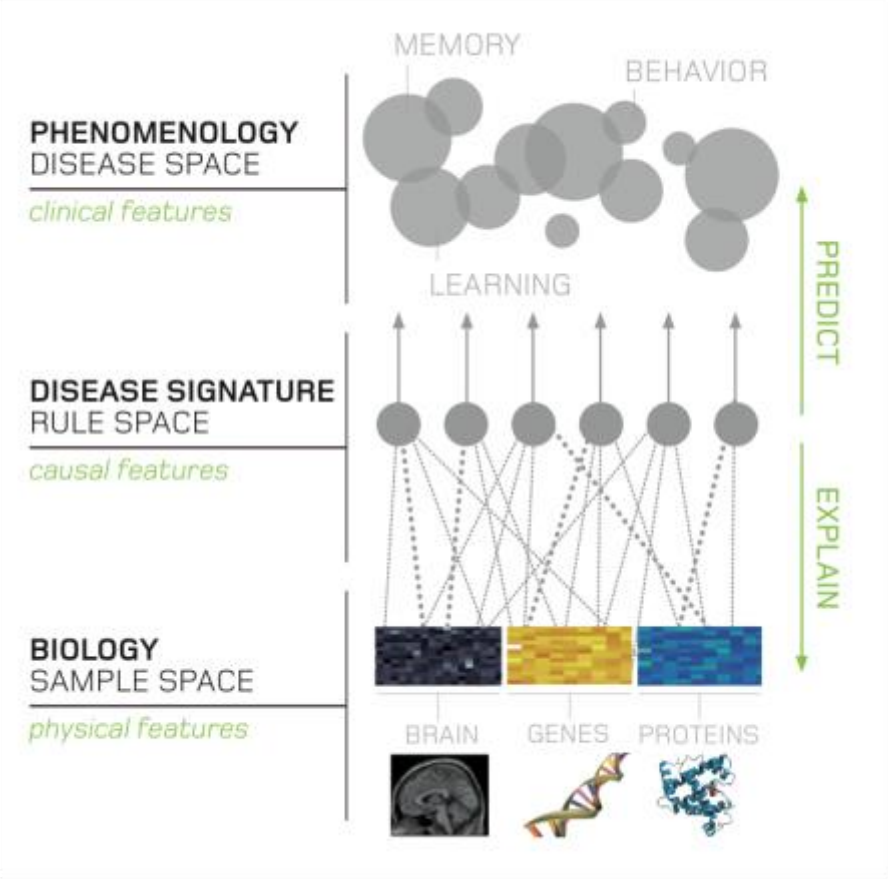
- many Labs create data about materials and compounds (experiments + simulations)
  - space of chemical compounds is endless
  - let's categorise this space to quickly find useful compound materials?
  - > 3 Mio aggregated entries now
- categorisation via Machine Learning etc.
- ***Revolution: writing paper is not the only scientific goal anymore***
- ***it's about repurposing***

DOBES – Humanities/Languages

- ~70 global teams
- ~80 TB in online archive
- 4 dynamic external copies
- remote archives

- how can one use data to validate theories about the evolution of languages (and cultures) over thousands of years
- how to understand which languages are more "economic" than others
- ***Revolution in humanities: scientific paper is not only goal anymore***
- ***it's about repurposing***

Brain Research – Detect Disease Patterns



- early detection of causal basis of brain diseases
- machine learning to correlate patterns in data with phenomena
- much data from various specialized labs and hospitals is required

- ***Revolution in medical world:***
  - ***sharing data outside of the hospitals - solving r & e***
  - ***it's about repurposing data***

What do they have in Common?

- addressing new questions by aggregating Big Data
- re-usage of data for different purposes
- huge effort to do the “integration” with complexity as most crucial factor
- why?
  - huge fragmentation of the solutions space, insufficient data management, lack of quality curation
  - rights & ethics difficult to sort out
  - lack of trained people at all layers
- results hardly reproducible (disaster for science)
- **data intensive work does not scale**
- **too many are excluded**
- **data challenges in industry not really different or?**

IoT Changes the Game

- billions of smart devices create continuous and highly granular data streams
- in many cases application of crowd sourcing model (who owns data?)
- massive data re-use for different purposes – optimisation, decision taking, etc.
- choices
  - “united Google data world” - hampering innovation
  - www with its pros and cons – www not made for DM
  - Digital Object Architecture, Global Digital Object Cloud
  - Type-Triggered Automatic Processing
  - etc.

What do we urgently need?

- dramatic reduction of costs through interoperability
  - global interop is expensive – where to settle?
- global forum of openly visible & sealed Digital Objects
  - change basic principles of exchanging data
  - separation of collection and transaction processes
- a domain of typed DO to allow automation
  - allow crawlers to find suitable data
- new models for rights and ethics to govern open forum
  - enable participation of owners and checks
- neutral bottom-up platform as a trusted entity to drive evolving data ecosystem
  - use RDA (constitution is similar to IETF)

Big Message

Towards an Open Forum of Sealed Data

Sealing means:

- resolvable unique identifier for each DO (Handle)

and associating crucial information with it such as

- unique identifier for owner (person, organisation)
- unique identifier for devices (IPv6, etc.)
- a fingerprint of the DO (checksum, etc.)
- a type ID (Handle)

It's all there, let's try it out systematically how to organize such a forum (RDA Plenary Berlin)

RDA is ready to leave scientific sector and open up to other sectors (industry)!

RDA Global

Email - enquiries@rd-alliance.org

Web - www.rd-alliance.org

Twitter - @resdatall

LinkedIn - www.linkedin.com/in/ResearchDataAlliance

Slideshare - http://www.slideshare.net/ResearchDataAlliance

RDA Europe

Email - info@europe.rd-alliance.org

Twitter - @RDA_Europe

RDA US

Twitter - @RDA_US