EMMC ASBL:
EMMO Governance and Inputs from EMMC 2021 workshop

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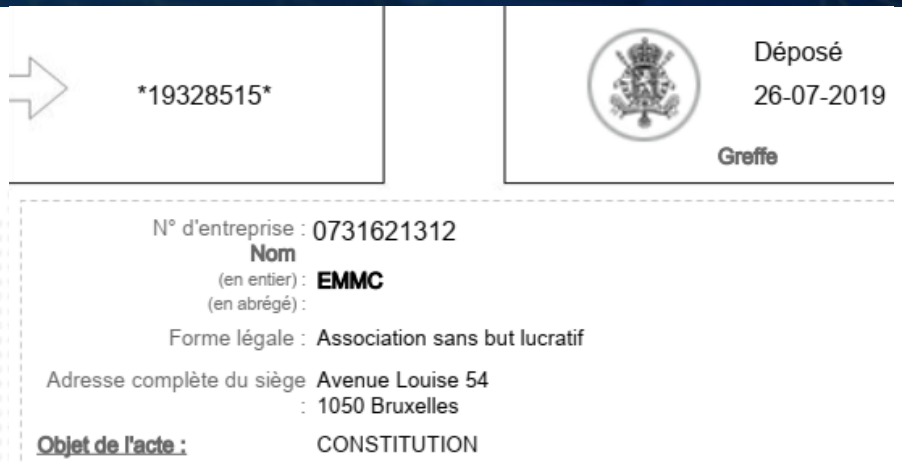
OntoCommons DORIC-MM Workshop, 15 March 2021

The European Materials Modelling Council

- A non-profit Association, **EMMC ASBL**, created in 2019
- Bottom-up, member driven, inclusive organisation
- Free Associate Membership for all
- Paid Organisational Memberships and Full Individual Memberships with voting rights

The European Materials Modelling Council considers the integration of materials modelling and digitalisation critical for more agile and sustainable product development.



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Déposé
26-07-2019
Greffe

N° d'entreprise : 0731621312
Nom
(en entier) : EMMC
(en abrégé) :
Forme légale : Association sans but lucratif
Adresse complète du siège : Avenue Louise 54
1050 Bruxelles
Objet de l'acte : CONSTITUTION

Board of Directors:
Nadja ADAMOVIC – Chair
Erich WIMMER –Co-Chair
Adham HASHIBON
Kersti HERMANSSON,
Jesper FRIIS
Denka Hristova-Bogaerds
Executive Secretary:
Gerhard GOLDBECK

Focus Areas and Task Groups: addressing key challenges

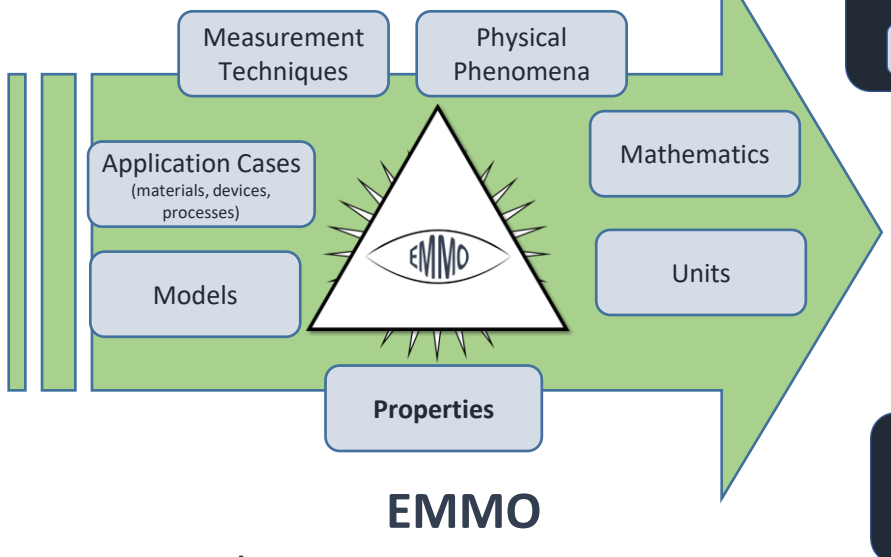
Model Development	Interoperability Ontologies	Digitalisation Marketplaces	Software deployment	Impact in Industry	Policy Roadmap
	Task Groups addressing specific topics				

https://emmc.eu/activities/emmc-focus-areas/

Interoperability and Digitalisation: **European Materials & Modelling Ontology**

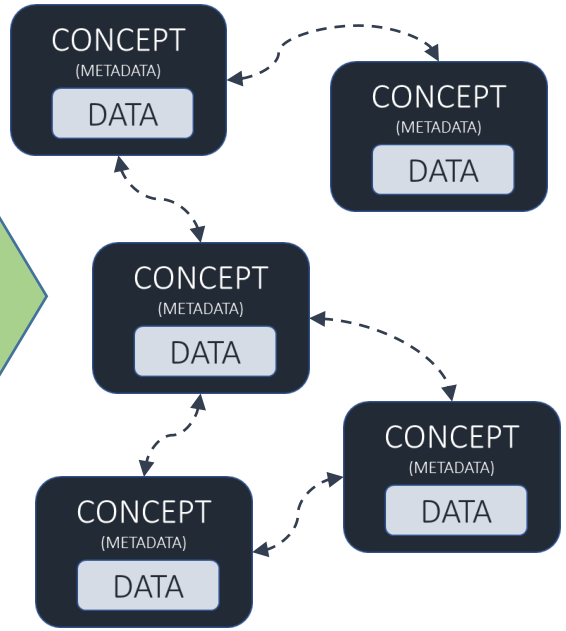
Physical World

Describe what we observe about the world in terms of properties



EMMO

- Based on
  - Physical Science
  - Analytical Philosophy
    - Mereotopology
    - Semiotics



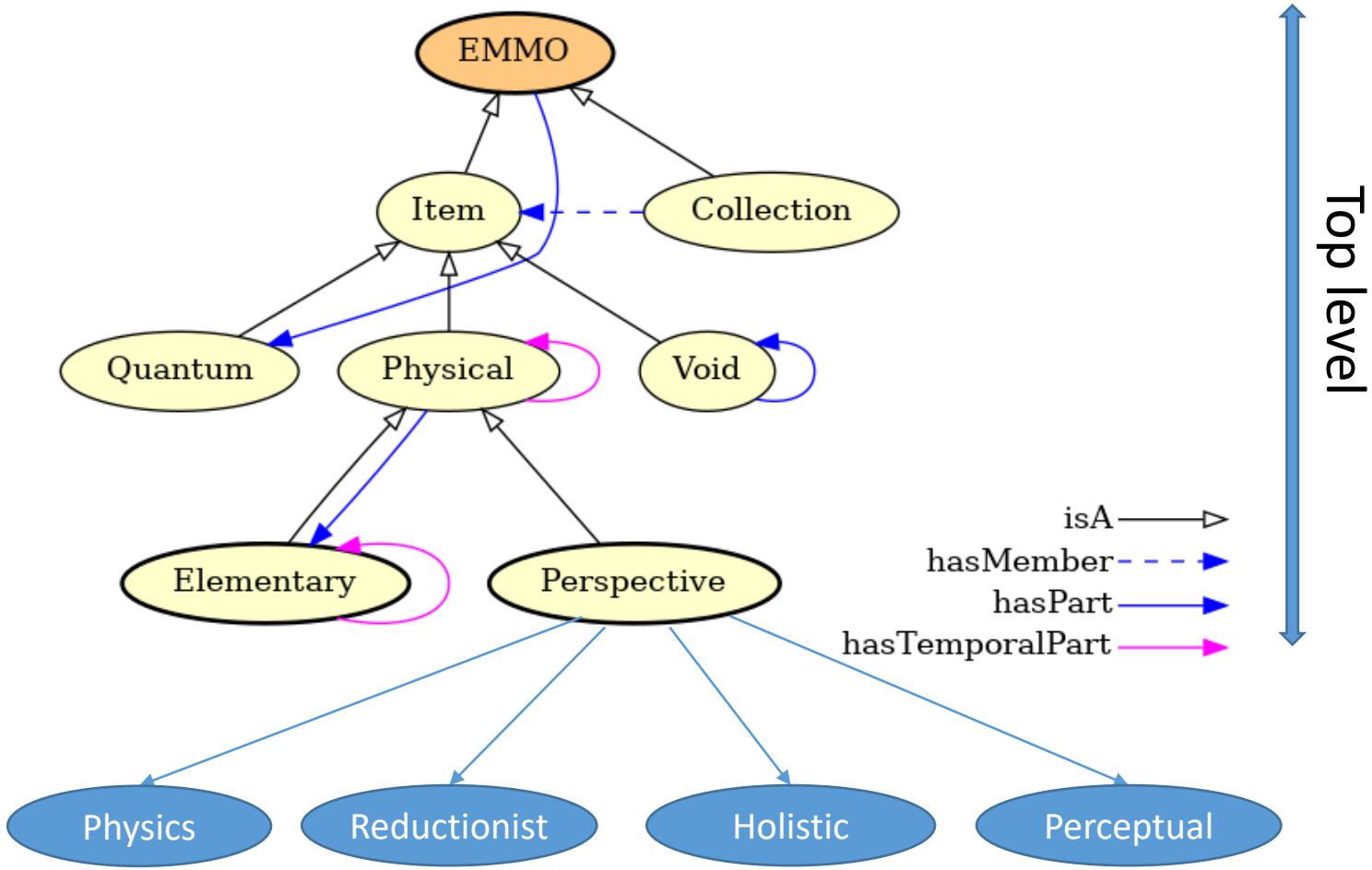
Digital Representation

- Domain and Application Ontologies
- Triple Stores

https://github.com/emmo-repo/

EMMO top, middle and domain levels

- Mid level developments include
  - Metrology International System of Quantities and SI
  - Position-based symbolic structures (e.g. list, array)
- Domain developments include
  - Crystallography
  - Electronic and Atomistic Modelling
  - Mechanical testing
  - Cultural Heritage



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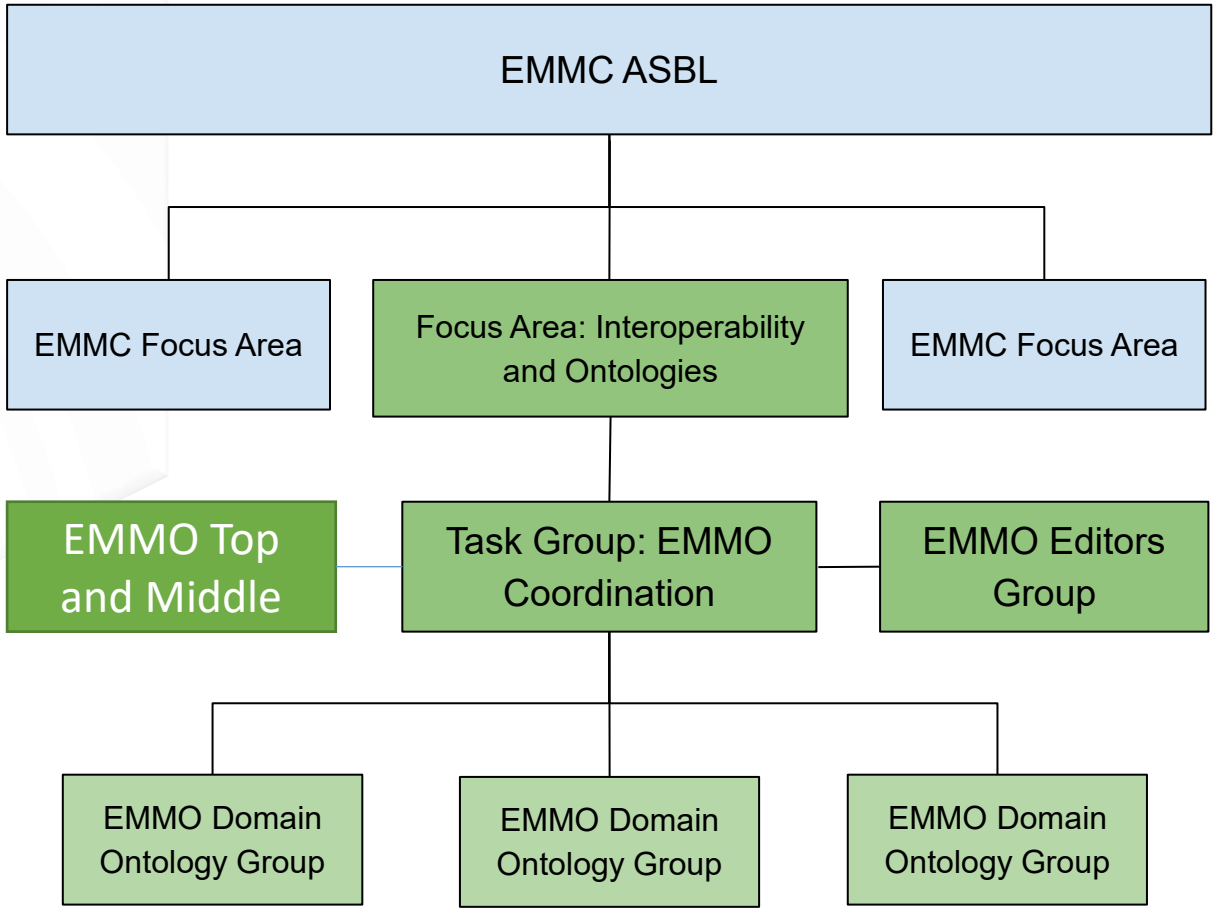
EMMO Governance and Task Groups



- EMMC is supporting governance of EMMO
- EMMO is located at https://github.com/emmo-repo
- EMMO licence: CC BY 4.0

Development and application of EMMO in European Projects

2016

EMMO foundations laid within EU project
EMMO governance managed by EMMC ASBL

European Materials Modelling Council, EMMC ASBL

EMMO applications cases

Team of philosophers, ICT experts and applied scientists.

ReaxPro SimDOME OYSTER

MarketPlace

Materials Modelling Marketplace for Increased Industrial Innovation

EMMO applied to larger materials modelling communities and marketplaces infrastructures.

VIMMP
VIRTUAL MATERIALS MARKETPLACE

Virtual Materials Market Place

ONTOTRANS

Ontology Driven Open Translation Environment

EMMO Domain ontologies and industrial application cases

ONTO COMMONS

Ontology-driven data documentation for Industry Commons

Ontologies and tools foundation for data documentation in materials and manufacturing industry

2024

Recent EMMC 2021

Four sessions were dedicated to Interoperability and Digitalisation

We shall share which Ontology Domains were discussed, what semantic types were covered, how people see the need for ontologies and the gaps we have to close

Discussed Ontology Domains

- Chemistry: ChEBI, CHMO (Chemical Methods Ontology), RXNO (Name reactions)
- Manufacturing resources
- Materials modelling: software metadata
- Materials properties
- Database Rest API integration
- Virtual Materials Marketplaces

+ Tools for working with Ontologies

Semantic Types

- Application Ontologies
- Metadata schema for annotating data
- Semantic/relational databases (pre-Ontology) with (standardised) RestAPIs
- Knowledge Graphs
- Markup languages to allow exchange of data

- Object oriented Programming languages (with classes, …)

Why do we need Ontologies?

- To make heterogeneous data “AI ready”
  - to unify the terminology, build standards, integrate data
- For text mining and natural language processing (NLP)
- Understanding of reality, make knowledge explicit
- To learn what can possibly exist
- Interoperability

Reported Gaps – Part 1

- More user input and feedback required to aid ontologists/data scientist with their ventures
- Too many choices out there, how to make the right one (TLO/MLO, etc)
- Missing standards or “standard silos” – need critical mass of stakeholders
- Taxonomy (people are still not speaking the same language)

- Lack of trusted information for industry

Reported Gaps – Part 2

- Infrastructure: need guidance and best practice on handling data and architecture, RDF files can become huge, not easy to handle
- **Uniformed APIs to "talk" to your data**
- Need expertise to link Ontologies with data bases, the web, other computer programs
- The data need to be ready! (FAIR, useful for ontologies, ML, AI, …)
- IP, licensing and privacy problems when sharing data vs a worldwide data ecosystem
- Trust (can we rely on 3rd party data?)
- GDPR or personal data protection in general compliant?
- Exposure, Comparison – especially for professional match making scenarios

Join the EMMC ASBL!
https://emmc.eu/register/

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