

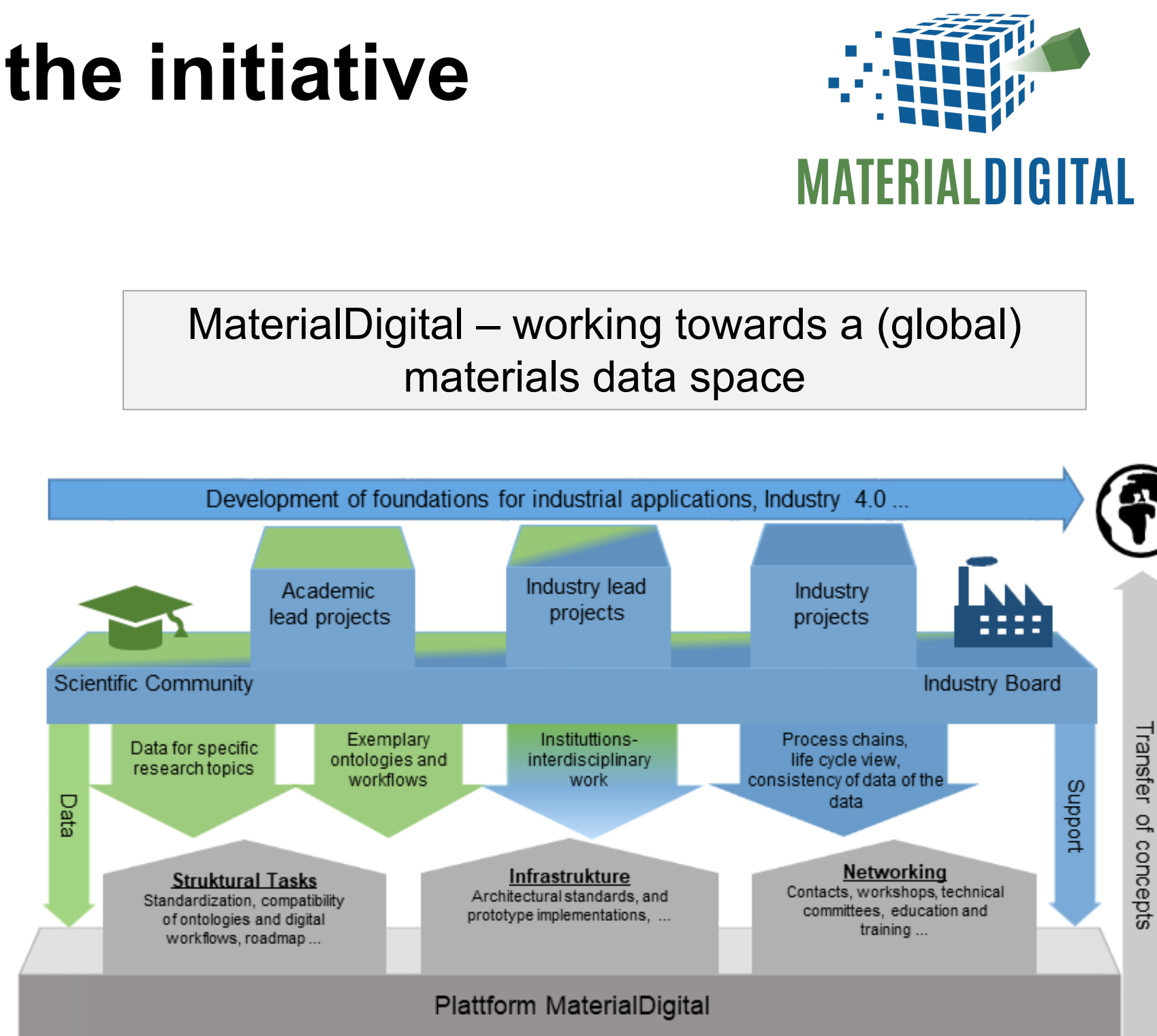
Structure and phases of the initiative

Long-term goals of the initiative

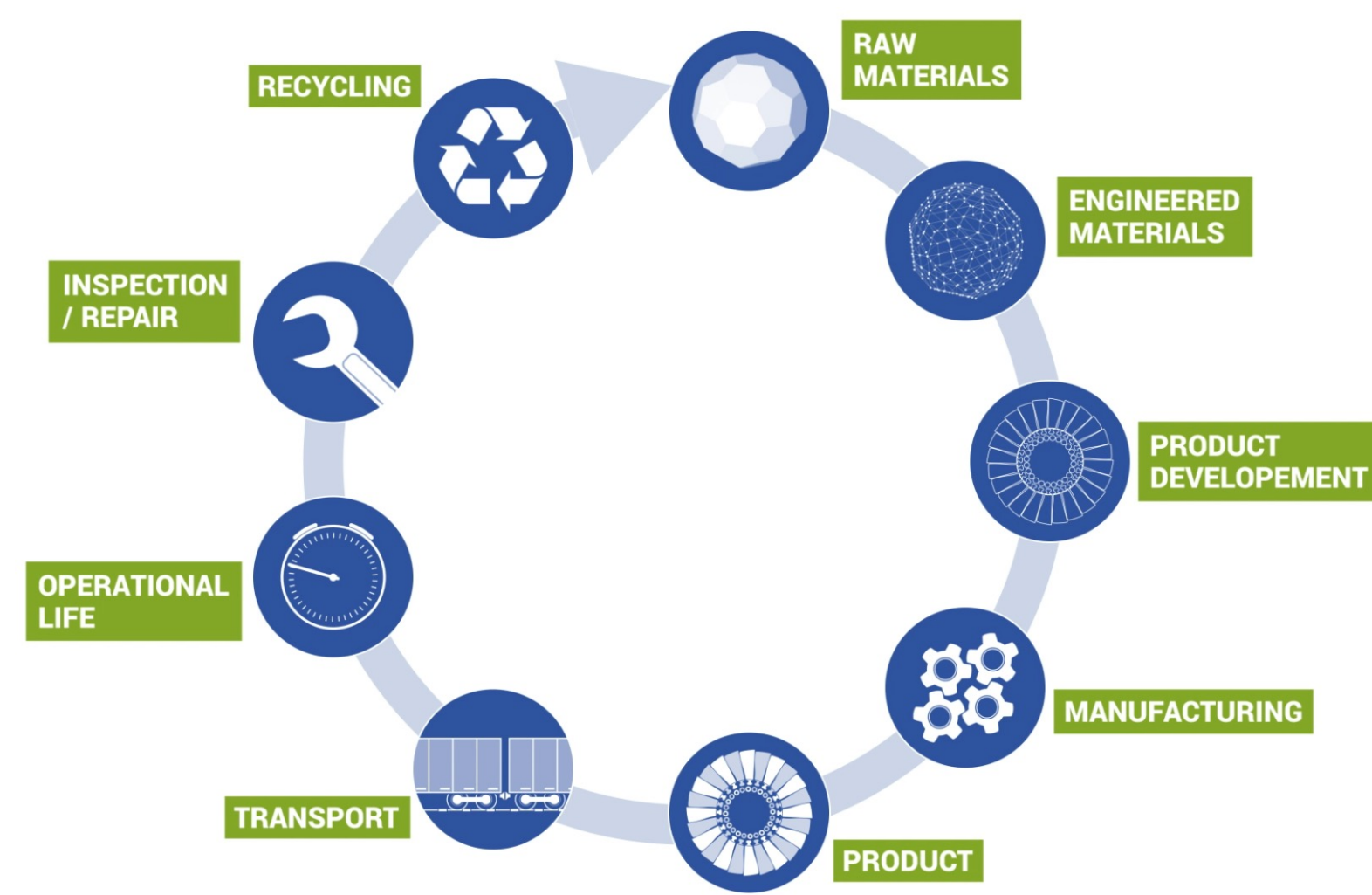
- represent the digital material in its life cycle
- map the digital material throughout entire process chains
- provide reliable material data for component design and evaluation
- focus on sustainability aspects

Platform MaterialDigital (PMD)

- offers prototypical solutions for infrastructure and tools
- develops common standards for data structuring and transfer
- develops architectural standards ontologies and workflows



Why Digitalization?



Full digitalization along processing chain allows sustainable use of information, e.g.:

- materials information during processing
- more knowledge in materialized products
- technological sovereignty

Which leads to:

- lower materials qualification costs
- lower product development costs
- better use of materials
- improved usability of components
- etc.

Core Working Areas of the PMD

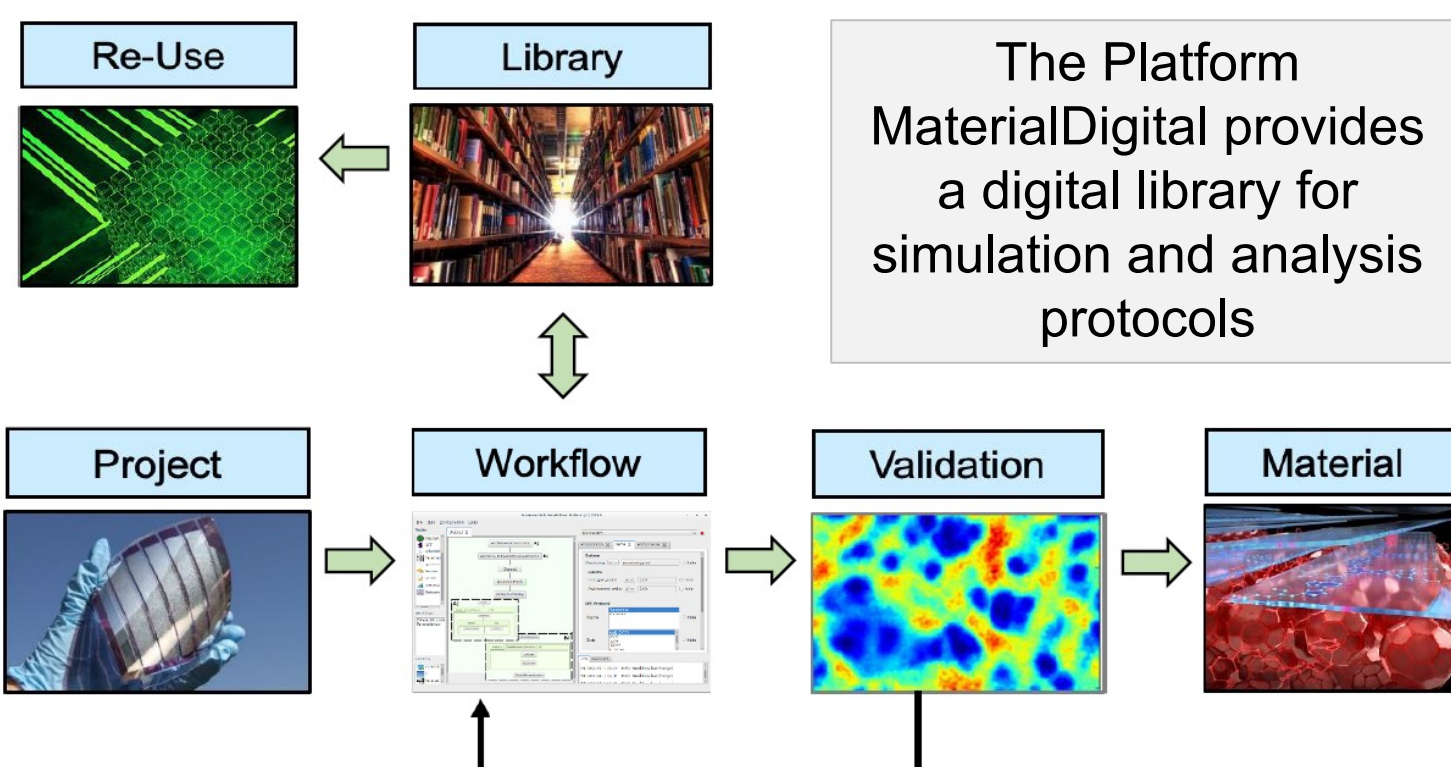
Workflows

Within MaterialDigital we provide an environment for combining different software tools in digital workflows and making each individual step of a chain of process steps accessible, interpretable, storable, and reproducible by the machine.

The Platform MaterialDigital supports two different workflow environments: **SimStack** and **pyiron**

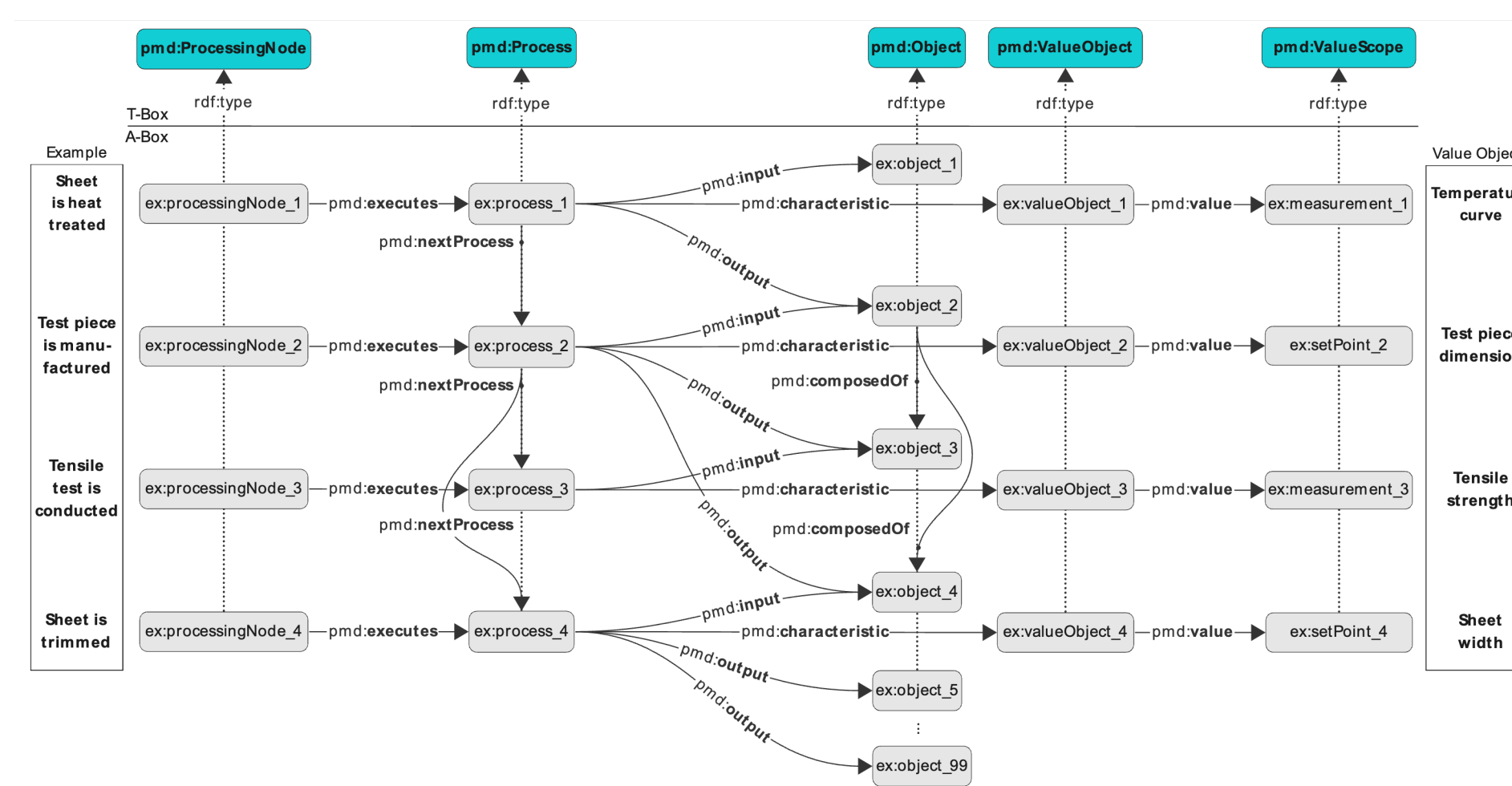


PMD Workflow Store
<https://workflows.material-digital.de>



Semantic Interoperability

Develop data structuring standards and agreements with the technological goal of achieving semantic interoperability of research data and services among stakeholders.



Advantages & benefits of using PMD core ontology (PMDco):

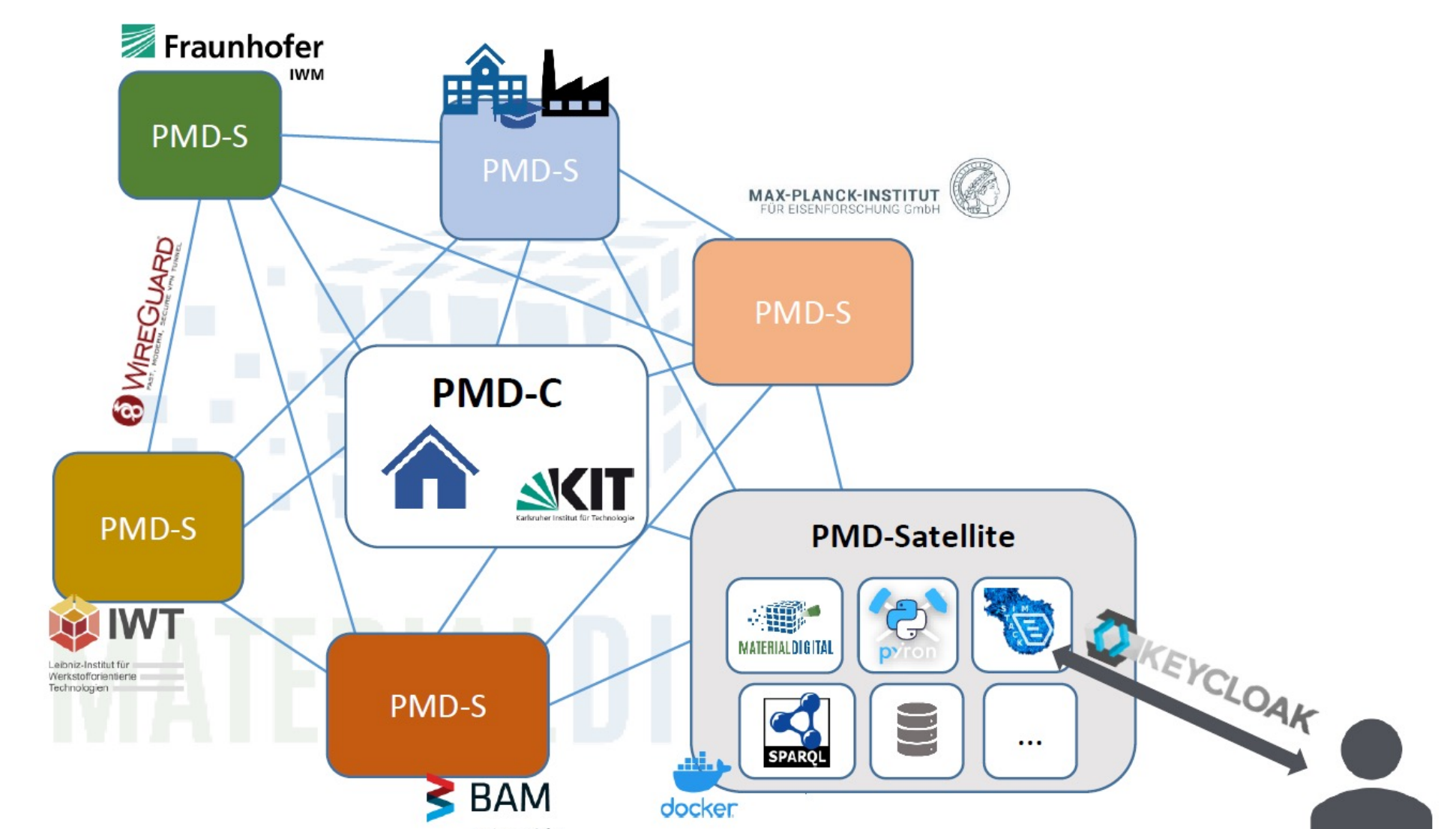
- comprehensive MSE vocabulary build on community consensus
- various mid-level classes to connect domain-specific application ontologies with top-level ontologies
- persistent, unique identifiers for long-lasting referencability
- user-friendly, accessible and well-documented
- enhance quality of processes, experiments and digital workflows
- support data sharing and data-driven research
- foster collaborations with other research partners

Architecture & IT-Infrastructure

Creating a safe network of interconnected digital workspaces for all types of PMD stakeholders leveraging several customizable authentication layers.

The PMD architecture prototype is built on state-of-the-art components:

- secure data transmission within the mesh (WireGuard)
- containerization of individual services (Docker)
- authentication/authorization (Keycloak)



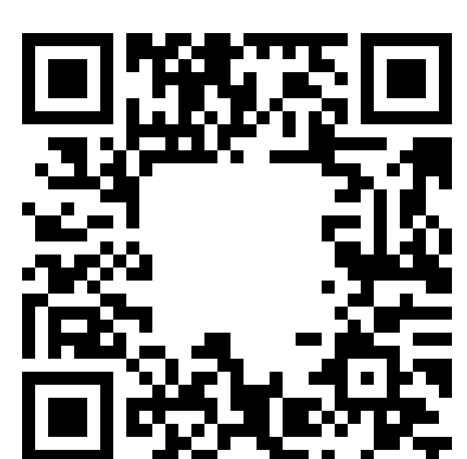
MaterialDigital Community

How can I participate?

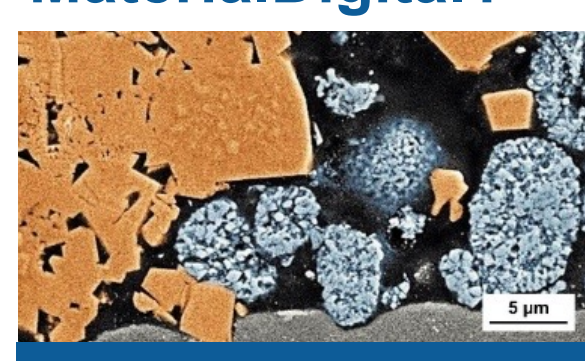
Information	Follow current status and share the concept and vision
Adaptation	Join our knowledge transfer via tutorials and information videos
Participation	Check GitHub and start transparent active discussions with the community via our forum
Implementation	Participate in individual groups, e.g. Ontology Playground and work on user stories for workflows



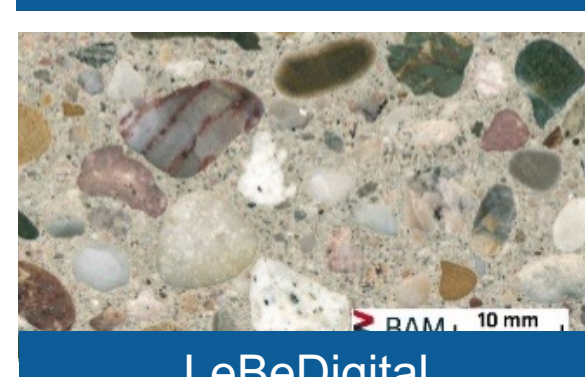
Our projects



MaterialDigital1



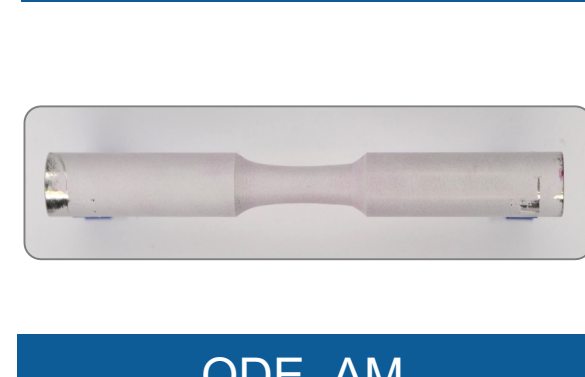
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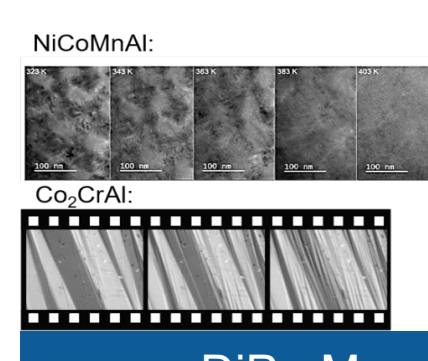
LeBeDigital



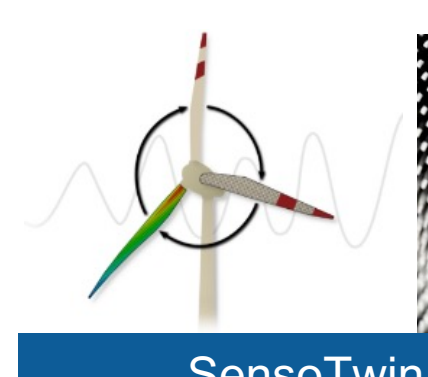
DIGITRUBBER



ODE_AM



DiProMag



SensoTwin



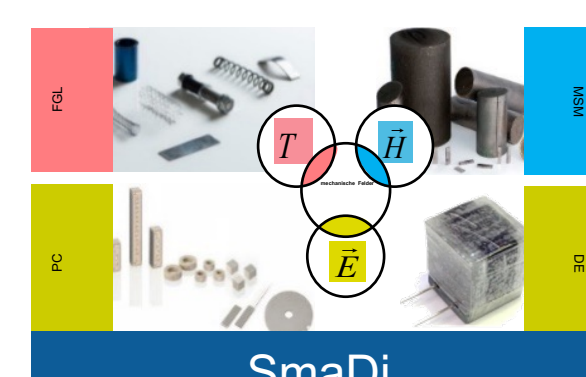
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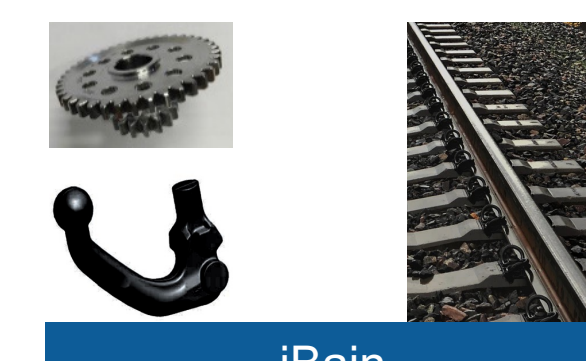
StahlDigital



GlasDigital



SmaDi



iBain



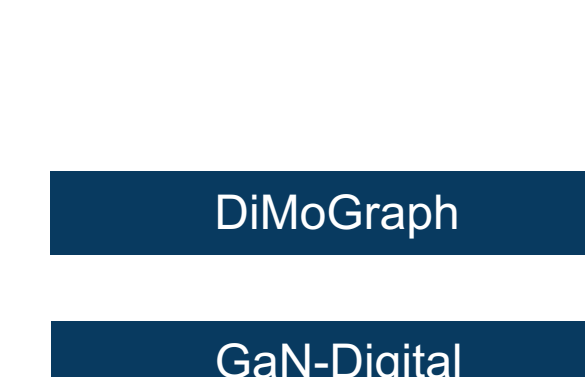
KNOW-NOW



KupferDigital



DigiMatUs



DiMoGraph



HybridDigital

A joint project by

