Materials Resource Registries Working Group

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Summary of the Problem

- Materials science is very broad and interdisciplinary
  - Primarily comes from: metallurgy, ceramics, polymer science
  - Plus: physics, chemistry, chemical engineering, geology, electronics, optics, biology
- Engineers need to answer questions like:
  - "What structural properties and processing methods are required to develop new lightweight materials that significantly improve fuel efficiency yet meet safety standards satisfied by traditional materials in use today?"
- Materials data is proliferating, but it is difficult and time-consuming to find and use

Goals

- Help users find data-related resources to improve design, research and collaboration
- By:
  - Defining and building consensus around minimum required metadata for materials science data discovery
  - Deploying metadata schema using pilot registry infrastructure developed by NIST
  - Validating with materials science data collections at organizations participating in the Working Group

Status of the Deliverable

- First version of the schema, supporting software, and vocabulary are being released
- Basic functionality in place for registering resources, harvesting between instances, and searching
- Initial deployments at two institutions
- Currently populating the MRR with records and continuing to test the components and system

Initial Adopters

- 2 instances running to date, collectively containing 260+ records:
  - NIST Materials Resource Registry
    - Materials.registry.nist.gov – NIST records plus a number of records related to the U.S. Materials Genome Initiative (MGI)
  - Center for Hierarchical Materials Design (CHiMaD) Materials Resource Registry
    - mrr.materialsdatafacility.org – Records associated with CHiMaD efforts
  - Records represent many institutions and types of resources
- Discussions with several other institutions

Expected Impact of the Deliverable

- Lay the groundwork to make materials resources and data more readily discoverable, accessible, and interoperable
- Support development of an ecosystem around making materials data and metadata available and machine-actionable
  - E.g., data for machine learning to develop new materials

Feedback Desired from RDA Community

- Where there are opportunities for collaboration (e.g., with other interest groups or projects)
- Materials Science resources to register
- Instances deployed as part of the federation
- Feedback on future materials metadata development and refinement

- Breakout session:
  - Joint meeting: IG RDA/CODATA Materials Data, Infrastructure & Interoperability, WG International Materials Resource Registries
  - Thursday, 21 Sept., 2017, 9-10:30
  - Room: Cartier 2

Expected Impact of the Deliverable

Before	After