From Data to Machine Readable Information
Aggregated in Research Objects

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@envinf
Introduction

- Data interpretation is key in scientific investigations
- Process with data as input and information as output
- Data are uninterpreted symbols, e.g. sensor observation values
- Information are interpreted data, for their meaning in a real-world context
- Record information resulting in data interpretation
Research Object

- “Semantically rich aggregations of resources that bring together data, methods and people in scientific investigations” (Bechhofer et al., 2013)

http://www.researchobject.org/
Proposal

- Extend the Research Object model
- Additional Resource type called *Interpretation*
- Instances represent information resulting from data interpretation
- Instances are machine readable
Proposed Extension
Application
Application

NewParticleFormationEvent

- type
  - e

- hasClarity
  - strong
Application

<> a ro:ResearchObject ;
ore:aggregates ex:d1, ex:f1, ex:d2, ex:s1, ex:e ;
dct:created "2016-08-11"^^xsd:dateTime ;
dct:creator [ a foaf:Person; foaf:name "Markus Stocker" ] .

ex:d1 a wf4ever:Dataset, qb:DataSet ;

ex:f1 a wf4ever:Image ;

ex:d2 a wf4ever:Dataset, qb:DataSet ;

ex:s1 a wf4ever:Software ;

ex:e a ex:NewParticleFormationEvent, ro:Interpretation ;
ex:hasClarity ex:strong .
Discussion

- Relevance of ontology because interpretation follows a conceptualization
- Share semantics between humans and machines
- Utilize interpretations to build models, e.g. machine learning classifiers
- Applicable also to Distributed Scholarly Compound Object (DiSCO)
- Link other PID types, e.g. ORCID iD

<> a ro:ResearchObject ;
   dct:creator [ a foaf:Person; dbo:orcidId "0000-0001-5492-3212" ] .
Conclusion

- Data interpretations are artefacts in scientific investigations
- Record interpretations in artefact aggregations, e.g. Research Object
- Record for humans *and* machines, not just images and natural language text