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| **Change Proposal:** DCO Instrument refactoring |
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| **Version:0.2** |
| **Date:01/30/2016** |

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| **Proposal**  *Create a dco:Instrument class that has obo:Instrument as a parent classes. Transfer properties that DCO-DS added to obo:Instrument to the new dco:Instrument class.*  *Add the new class dco:InstrumentDesign to represent the design of instruments that are then built (dco:Instrument).*  *Relate both of these new concepts, dco:Instrument and dco:InstrumentDesign, into a dco:InstrumentInitiative.*  *Utilize the Semantic Sensor Network ontology for platform, deployment, sensors, sensing, etc… related to instruments that include sensing devices.* |
| **Background**  *The purpose of this change is to support the new use cases related to instruments as worked out with Karyn Rogers and the needs of the secretariat to track instrument initiatives dynamically.*  *Karyn has designed a new instrument and built two of them. In this case we need to be able to specify what properties an instrument measures and when the instrument is deployed and on what platform. Also what project(s) and grant(s) were utilized in the design and then the construction of the instruments. Karyn Rogers will be the instruments owner but she will be loaning them out to people to use. Keeping track of how they are used, datasets that are generated from them, etc… is key in reporting to funding agencies and obtaining future funding.*  *Also, the current use of obo:Instrument employs ontology hijacking in that we’ve modified the meaning of obo:Instrument to meet the needs of the DCO ontology. With these proposed changes we create a new dco:Instrument with obo:Instrument as parent class and move properties that we had added to obo:Instrument to dco:Instrument.*  *Engagement and Secretariat have created a static page on the DCO Community Portal called the Instrument Initiatives page. Each "initiative" relates the design of an instrument with the construction of physical devices, has news articles, project information, related publications and more.* |
| **Does this change affect the semantics of the ontology?**  *Yes. We remove the changes that we’ve made to obo:Instrument and create a new class dco:Instrument. This should revert the meaning of obo:Instrument back to its original and correct meaning. We introduce dco:Instrument and everything that is related to the instruments. And finally we will be introducing the Semantic Sensor Network ontology to DCO.* |
| **Describe in detail the change being requested**  *We create a new class dco:Instrument with parent classes obo:Instrument.*  *Take all of the properties that were added to obo:Instrument and make them properties of dco:Instrument*   * *dco:Instrument -> vivo:description -> xsd:string* * *dco:Instrument -> rdfs:label -> xsd:string* * *dco:Instrument -> dco:associatedDCOTeam -> dco:Team* * *dco:Instrument -> dco:associatedDCOCommunity -> dco:ResearchCommunity* * *dco:Instrument -> dco:instrumentUsedBy -> vivo:Project -> dco:usedInstrument -> dco:Instrument* * *dco:Instrument -> dco:referencedByUpdate -> dco:ProjectUpdate -> dco:refersToInstrument -> dco:Instrument* * *dco:Instrument -> dco:instrumentCreatedBy -> vivo:Project -> dco:createdInstrument -> dco:Instrument* * *dco:Instrument -> vivo:hasFundingVehicle -> vivo:Grant -> vivo:fundingFor -> dco:Instrument*   *Add properties for the instrument’s design*   * *dco:Instrument -> dco:ofInstrumentDesign -> dco:InstrumentDesign -> dco:instrumentBuilt -> dco:Instrument* * *dco:InstrumentDesign -> rdfs:label -> xsd:string* * *dco:InstrumentDesign -> vivo:description -> xsd:string* * *dco:InstrumentDesign -> dco:associatedDCOCommunity -> dco:ResearchCommunity* * *dco:InstrumentDesign -> dco:associatedDCOTeam -> dco:Team* * *dco:InstrumentDesign -> vivo:hasFundingVehicle -> vivo:Grant -> vivo:fundingFor -> dco:InstrumentDesign* * *dco:InstrumentDesign -> dco:referencedByUpdate -> dco:ProjectUpdate -> dco:refersToInstrumentDesign -> dco:InstrumentDesign* * *dco:InstrumentDesign -> dco:instrumentDesignedBy -> vivo:Project -> dco:createdInstrumentDesign -> dco:InstrumentDesign*   *Add Instrument Initiative that represents both the construction of the physical devices (dco:Instrument) and the design of those devices (dco:InstrumentDesign)*   * *dco:InstrumentInitiative -> rdfs:label -> xsd:string* * *dco:InstrumentInitiative -> vivo:description -> xsd:string* * *dco:InstrumentInitiative -> vitro:mainImage -> vitro:File* * *dco:InstrumentInitiative ->rdfs:seeAlso -> xsd:anyURI* * *dco:InstrumentInitiative -> dco:relatedNewsArticle -> xsd:anyURI* * *dco:InstrumentInitiative -> dco:builtInstrument -> dco:Instrument -> dco:builtDuringInitiative -> dco:InstrumentInitiative* * *dco:InstrumentInitiative -> dco:designedInstrument -> dco:InstrumentDesign -> dco:designedDuringInitiative -> dco:InstrumentInitiative* * *dco:InstrumentInitiative -> dco:associatedPublication -> bibo:Document*   *Add properties for the point of contact*   * *dco:Instrument -> dco:hasPointOfContact -> dco:PointOfContact -> dco:pointOfContactFor -> dco:Instrument* * *dco:PointOfContact -> rdfs:label -> xsd:string* * *dco:PointOfContact -> vivo:description -> xsd:string* * *dco:PointOfContact -> dco:hasContact -> foaf:Agent* * *dco:PointOfContact -> dco:hasContactInformation -> xsd:string* * *dco:PointOfContact -> vivo:dateTimeInterval -> vivo:DateTimeInterval*   [*http://cmapspublic3.ihmc.us/rid=1PSRC828N-1X79HZJ-1G13/dco-instrument-model-new.cmap*](http://cmapspublic3.ihmc.us/rid=1PSRC828N-1X79HZJ-1G13/dco-instrument-model-new.cmap)  *ssn:* [*https://www.w3.org/2005/Incubator/ssn/ssnx/ssn*](https://www.w3.org/2005/Incubator/ssn/ssnx/ssn) |
| **Example Usage**  *push50 -> a dco:InstrumentDesign*  *push50 -> dco:instrumentDesignedBy -> project-x*  *push50-1 -> a dco:Instrument*  *push50-1 -> a ssn:SensingDevice*  *push50-1 -> dco:ofInstrumentDesign -> push50*  *push50-1 -> dco:hasPointOfContact -> contact-1 -> dco:hasContact -> KarynRogers*  *push50-1 -> dco:dco:instrumentCreatedBy -> project-y*  *push50-1 -> ssn:hasDeployment -> cruise-5019*  *push50-1 -> ssn:onPlatform -> USSEnterprise -> ssn:hasAttachedSystem -> push50-1*  *push50-1 -> ssn:observes -> ssn:Property*  *push50 -> dco:designedDuring -> push50Initiative*  *push50-1 -> dco:builtDuring -> push50Initiative*  *push50-2 -> dco:builtDuring -> push50Initiative*  *Eample2*  *CarnegieComputingCluster -> a dco:Instrument*  *CarnegieComputingCluster -> dco:ofInstrumentDesign -> CarnegieComputingClusterDesign a dco:InstrumentDesign*  *CarnegieComputingCluster -> dco:hasPointOfContact -> contact-2 -> dco:hasContact -> RobertSmith*  *CarnegieComputingCluster -> dco:instrumentCreatredBy -> project-y*  *CarnegieConputingClusterDesign -> dco:instrumentDesignedBy -> project-y*  *CarnegieComputingCluster -> dco:builtDuring -> CarnegieComputingClusterInitiative*  *CarnegieComputingClusterDesgin -> dco:designedDuring -> CarnegieComputingClusterInitiative* |
| **Describe the reason for the change**  *New functionality to support the design and creation of new instruments, their use by projects, deployed on different platforms such as a research vessel, the different observations collected by the instrument, and a point of contact for the instrument so that others can request use of the instrument.* |
| **What are the anticipated impacts**  *Pros:*   * *New functionality will be supported*   + *Dynamic generation of pages in community portal*   + *Ability to contact instrument owners to reserve use of interest or find out more information*   + *Separation of instrument design and instrument construction*   *Cons:*   * *None anticipated* |
| **What are the risks of not performing the change?**  *New features will not be supported* |
| **What is the expected technical effort to support the change?**   1. *Ontology Changes* 2. *Instrument Initiatives static page will now be dynamically generated using twsparql* 3. *Data entry of current static content on Instrument Initiatives page into VIVO* 4. *Generic summary page for Instrument Initiative created using twsparql* 5. *Custom form in VIVO for creating the instrument initiative, instrument design and instruments* 6. *Instrument Browser to allow users to search for and discover instruments used within the DCO community* |
| **Describe alternatives considered**  *None considered* |
| **Related change proposals**  *Change proposal for dco:ResearchVessel:* [*https://docs.google.com/document/d/12Lpl6Ae1KjGwX00fG3FsCglkwiSmKcSANTSe9z6DK2k/edit*](https://docs.google.com/document/d/12Lpl6Ae1KjGwX00fG3FsCglkwiSmKcSANTSe9z6DK2k/edit) |
| **Notes** |