# Parthenos Entities: Research Infrastructure Model DRAFT

V3.0

FORTH-ICS

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Document History

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| Version/date | Date | Changes/approval | Author/Approved by |
| V 1.0 | 25/5/2016 | Initial version | George, Martin |
| V 1.1 | 25/5/2016 | Minor Editing | George |
| V 1.2 | 2/6/2016 | Relation pe27 add | George |
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| V 1.4 | 7/6/2016 | Minor Editing | George |
| V 1.5 | 10/6/2016 | Alignment with discussions from WP5/6 Joint Meeting in Crete | George |
| V1.6 | 11/7/2016 | Corrections to document based on feedback from CNR.  Corrections and feedback on model from Athina.  Check of IsA relations on classes and properties. Fixed where necessary.  Added names to all relations and classes in relation description tables.  Added shortcut links to all relations for easier use of doc.  Added more referred classes and relations from CIDOC CRM and CRMdig.  Made extended names for repeated relation names like ‘has part’ in order to conform with Gcube.  Added class and relation hierarchy table for ease of navigation of doc + better overview of model. | George, Leonardo Candela, Athina |
| V1.7 | 18/8/2016 | Added three new properties to the model pp39 is metadata for and pp40 created successor of, pp41 is index of. These three properties are added in order to allow tracking and management of changes in metadata. | Doerr, Bruseker |
| V1.8 | 30/8/2016 | Added new property pp42 ‘has declarative time’ | Bruseker |
| V1.8.1 | 3/2/2017 | Correction to document, indicating declaration of PE20 Volatile Digital Object as subclass of PE32 Curated Thing;  Part of general alignment to RDFS 1.8.1 after corrections from WP6 team | Bruseker;Frosini |
| V1.9 | 13/2/2017 | Introduction of new classes:  PE33 E-Access Brokering Service  PE34 Team  PE35 Project  PE36 Competency Type  PE37 Protocol Type  PE38 Schema  And new relations:  PP43 supported project activity (was project activity supported by)  PP45 was competence (had competence of)  PP46 brokered access to (had access brokered by)  PP47 had protocol type (was protocol type of)  PP48 used protocol parameter (was protocol parameter of)  Updated:  PE25 RI Consortium  PP25 is maintained by (label)  PE25 RI Consortium, now subclass of E34 Team, not E40 Legal Body  PE26 RI Project now subclass of PE35 Project and not E7 Activity (directly) | Bruseker |
| V1.10 | 10/3/2017 | Harmonization with RDFS, updating all relation classes declared in PE to present tense format to reflect ‘current state of knowledge’ position. | Theodoridou; Bruseker |
| V1.11 | 14/3/2017 | Changed PP45 has competence (is competence of) to PP45 has competency (is competency of) | Theodoridou; Bruseker |
| V2.0 | 12/4/2017 | Removed draft classes judged unnecessary for PE model (related to provenance, to be expressed elsewhere) | Bruseker |
| V3.0 | 14/4/2018 | Introduced classes PE39 through PE44 and relations  PP51 through PP60. This adds some convenient shortcut and type properties, the ability to model awards and funding and the ability to indicate audience and geographic scope of an activity. | Bruseker |

**Parthenos Entities:** **Research Infrastructure Model DRAFT**

The Parthenos Entities (PE) propose an ontological model and RDF schema to encode data of use in supporting the activities and aims of research infrastructures to pool and connect services, software, datasets and to enable users of such services to reach the actors and understand the knowledge generation processes which generated the offered datasets. Research infrastructures integrate highly heterogeneous resources for an often equally heterogeneous public. A central component of the activity of and RI in a digital environment involves building a data model that will support intuitive and accurate recall of information produced within the domain supported. It is the implicit or explicit belief of communities that organize into RIs that the integration of data from different members of the community offers not only the possibility of more efficient research and knowledge sharing but also the asking and answering of new questions by the crossing of data by sections of the community that normally would not consider their data in relation. Within this frame, PE proposes an ontological model that tries to capture the general basic entities deployed in building RI registries which is offered both as an intellectual tool for the checking and generation of such models and also as a means to create a common expression by which data could be shared across research communities, thus creating an RI of RIs. Such an effort is a logical extension of the belief inherent to individual research communities but broadened to an interdisciplinary scale.

PE is modelled as an extension of CIDOC CRM, the ISO standard ontology for cultural heritage data, and CRMdig, an extension of the latter which models provenance information in digitization processes. In this way, the modelling of a minimal metadata set for use in a registry as proposed above can be complimented by full modelling of detailed datasets in order to provide a rich web of data that can be accessed from the starting point of an RI registry. CIDOC CRM with its open extension policy and support of analytic data generated by empirical sciences with regards to the human past provides a suitably general ontology to allow for the integration of data across a wide spread of humanities and scientific disciplines.

PE is being developed in the context of the Parthenos Project, a European funded project.

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# Hierarchies

## Class Hierarchy

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **IsA Hierarchy** | **Orig.** | **Reg?** |
| [E7](#_E7_Activity) | Activity | CRM | N |
| [PE35](#_PE35_Project) | Project | PE | Y |
| [PE26](#_PE26_RI_Project) | RI Project | PE | Y |
| [PE27](#_PE27_Service_Action) | Service Action [Draft] | PE | Y |
| [PE1](#_PE1_Service) | Service | PE | Y |
| [PE2](#_PE2_Hosting_Service) | Hosting Service | PE | Y |
| [PE5](#_PE5_Digital_Hosting) | Digital Hosting Service | PE | Y |
| [PE6](#_PE6_Software_Hosting) | Software Hosting Service | PE | Y |
| [PE13](#_PE13_Software_Computing) | Software Computing E-Service | PE | Y |
| [PE16](#_PE16_Curated_Software) | Curated Software E-Service | PE | Y |
| [PE14](#_PE14_Software_Delivery) | Software Delivery E-Service | PE | Y |
| [PE16](#_PE16_Curated_Software) | Curated Software E-Service | PE | Y |
| [PE7](#_PE7_Data_Hosting) | Data Hosting Service | PE | Y |
| [PE15](#_PE15_Data_E-Service_1) | Data E-Service | PE | Y |
| [PE17](#_PE17_Curated_Data) | Curated Data E-Service | PE | Y |
| [PE3](#_PE3_Curating_Service) | Curating Service | PE | Y |
| [PE10](#_PE10_Digital_Curating) | Digital Curating Service | PE | Y |
| [PE11](#_PE11_Software_Curating) | Software Curating Service | PE | Y |
| [PE16](#_PE16_Curated_Software) | Curated Software E-Service | PE | Y |
| [PE12](#_PE12_Data_Curating) | Data Curating Service | PE | Y |
| [PE17](#_PE17_Curated_Data_1) | Curated Data E-Service | PE | Y |
| [PE8](#_PE8_E-Service) | E-Service | PE | Y |
| [PE33](#_PE33_E-Access_Brokering) | E-Access Brokering Service | PE |  |
| [PE13](#_PE13_Software_Computing_1) | Software Computing E-Service | PE | Y |
| [PE16](#_PE16_Curated_Software) | Curated Software E-Service | PE | Y |
| [PE14](#_PE14_Software_Delivery_1) | Software Delivery E-Service | PE | Y |
| [PE16](#_PE16_Curated_Software) | Curated Software E-Service | PE | Y |
| [PE15](#_PE15_Data_E-Service_1) | Data E-Service | PE | Y |
| [PE17](#_PE17_Curated_Data_1) | Curated Data E-Service | PE | Y |
| [E65](#_E65_Creation) | Creation | CRM | N |
| [E77](#_E77_Persistent_Item) | Permanent Item | CRM | N |
| [E39](#_E39Actor) | Actor | CRM | Y |
| [E74](#_E74_Group) | Group |  |  |
| [E40](#_E40_Legal_Body) | Legal Body | CRM | Y |
| [PE34](#_PE34_Team) | Team |  |  |
| [PE25](#_PE25_RI_Consortium) | RI Consortium | PE | Y |
| [E70](#_E70_Thing) | Thing | CRM | Y |
| [PE32](#_PE32_Curated_Thing) | Curated Thing | PE | Y |
| [E78](#_E78_Curated_Holding) | Curated Holding | CRM | Y |
| [PE20](#_PE20_Volatile_Digital) | Volatile Digital Object | PE | Y |
| [E71](#_E71_Man_Made) | Man Made Thing | CRM | N |
| E24 | Physical Man Made Thing | CRM | N |
| E78 | Curated Holding | CRM | Y |
| E28 | Conceptual Object | CRM | N |
| E55 | Type |  |  |
| PE36 | Competency Type |  |  |
| PE37 | Protocol Type |  |  |
| E89 | Propositional Object | CRM | N |
| E73 | Information Object | CRM | N |
| E29 | Design or Procedure | CRM | N |
| [PE28](#_PE28_Curation_Plan) | Curation Plan | PE | Y |
| [D1](#_D1_Digital_Object) | Digital Object | dig | Y |
| [PE19](#_PE19_Persistent_Digital) | Persistent Digital Object | PE | Y |
| [PE21](#_PE21_Persistent_Software) | Persistent Software | PE | Y |
| [PE22](#_PE22_Persistent_Dataset) | Persistent Dataset | PE | Y |
| [PE20](#_PE20_Volatile_Digital_1) | Volatile Digital Object | PE | Y |
| [PE23](#_PE23_Volatile_Software) | Volatile Software | PE | Y |
| [PE24](#_PE24_Volatile_Dataset) | Volatile Dataset | PE | Y |
| [PE18](#_PE18_Dataset) | Dataset | PE | Y |
| [PE22](#_PE22_Persistent_Dataset) | Persistent Dataset | PE | Y |
| [PE24](#_PE24_Volatile_Dataset) | Volatile Dataset | PE | Y |
| [D14](#_D14_Software) | Software | dig | Y |
| [PE21](#_PE21_Persistent_Software) | Persistent Software | PE | Y |
| PE38 | Schema |  |  |
| [PE23](#_PE23_Volatile_Software) | Volatile Software | PE | Y |

## Relations Hierarchy

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # | Hierarchy | Domain | Range | Origin |
| [P1](#_P1_is_identified) | is identified by | E1 CRM Entity | E41 Appelation | CRM |
| [PP28](#_pp28_has_designated) | has designated access point (is designated access point of) | PE8 E-Service | PE29 Access Point | PE |
| [PP50](#_PP50_accessible_at) | Accessible at (provides access to) | D1 Digital Object | PE29 Access Point |  |
| [P9](#_p9_consists_of) | consists of (forms part of) | E4 Period | E4 Period | CRM |
| [PP1](#_pp1__currently) | currently offers (currently offered by) | PE26 RI Project | PE1 Service | PE |
| PP43 | supports project activity (is project activity supported by) | PE35 Project | E7 Activity |  |
| [PP38](#_pp38_executes_(was) | Executes (is executed by) | PE1 Service | PE27 Service Action | PE |
| [P14](#_p14_carried_out) | carried out by (performed) | E7 Activity | E39 Actor | CRM |
| [PP2](#_pp2_provides_(provided) | Provided by (provides) | PE1 Service | E39 Actor | PE |
| [PP3](#_pp3_requests_(requested) | Requested by (requests) | PE27 Service Action | E39 Actor | PE |
| [P15](#_p15_was_influenced) | was influenced by (influenced) | E7 Activity | E1 CRM Entity | CRM |
| [PP44](#_PP44_has_maintaining) | has maintaining team (is maintaining team of) | PE35 Project | PE34 Team |  |
| [PP25](#_pp25_is_maintained) | has maintaining RI (is maintaining RI of) | PE26 RI Project | PE25 RI Consortium | PE |
| [P16](#_p16_used_specific) | used specific object (was used for) | E7 Activity | E70 Thing | CRM |
| [PP4](#_pp4__hosts) | hosts object (is object hosted by) | PE2 Hosting Service | E70 Thing | PE |
| [PP6](#_pp6_hosts_digital) | hosts digital object (is digital object hosted by) | PE5 Digital Hosting Service | D1 Digital Object | PE |
| [PP7](#_pp7_hosts_software) | hosts software object (is software object hosted by) | PE6 Software Hosting Service | D14 Software | PE |
| [PP8](#_pp8_hosts_dataset) | hosts dataset (is dataset hosted by) | PE7 Data Hosting Service | PE18 Dataset | PE |
| [PP14](#_pp14_runs_on) | runs on request (is run by) | PE13 Software Computing E-Service | D14 Software | PE |
| [PP15](#_pp15_delivers_on) | delivers on request (is delivered by) | PE14 Software Delivery E-Service | D14 Software | PE |
| [PP29](#_pp29_uses_access) | uses access protocol (is access protocol used by) | PE8 E-Service | D14 Software | PE |
| [PP48](#_PP48_uses_protocol) | uses protocol parameter (is protocol parameter of) | PE8 E-Service | PE38 Schema |  |
| [PP49](#_PP49_provides_access) | provides access point (is access point provided by) | PE8 E-Service | E29 Access Point |  |
| [PP40](#_pp40_created_successor) | created successor of (is deprecated by) | E65 Creation | PE22 Persistent Dataset | PE |
| P21 | had general purpose (was purpose of) | E7 Activity | E55 Type |  |
| [PP45](#_PP45_has_competence) | has competency (is competency of) | PE1 Service | PE36 Competency Type |  |
| [PP32](#_pp32_curates_(was) | curates (is curated by) | PE3 Curating Service | PE32 Curated Thing | PE |
| [PP11](#_pp11_curates_volatile) | curates volatile digital object (is volatile digital object curated by) | PE10 Digital Curating Service | PE20 Volatile Digital Object | PE |
| [PP12](#_pp12_curates_volatile) | curates volatile software (is volatile software curated by) | PE11 Software Curating Service | PE23 Volatile Software | PE |
| [PP13](#_pp13_curates_volatile) | curates volatile dataset (is volatile dataset curated by) | PE12 Data Curating Service | PE24 Volatile Dataset | PE |
| [P147](#_p147_curated_(was) | curated (was curated by) | E87 Curation Activity | E78 Curated Holding | CRM |
| [P33](#_p33_used_specific) | used specific technique (was used by) | E7 Activity | E29 Design or Procedure | CRM |
| [PP31](#_pp31_used_curation) | uses curation plan (is curation plan used by) | PE3 Curating Service | PE28 Curation Plan | PE |
| [P106](#_p106_is_composed) | is composed of (forms part of) | E90 Symbolic Object | E90 Symbolic Object | CRM |
| [PP16](#_pp16__has) | has persistent digital object part (is persistent digital object part of) | PE19 Persistent Digital Object | PE19 Persistent Digital Object | PE |
| [PP19](#_pp19_has_persistent) | has persistent software part (is persistent software part of) | PE21 Persistent Software | PE21 Persistent Software | PE |
| [PP20](#_pp20_has_persistent) | has persistent dataset part (is persistent dataset part of) | PE22 Persistent Dataset | PE22 Persistent Dataset | PE |
| [PP18](#_pp18_has_D/O) | has digital object part (is digital object part of) | PE20 Volatile Digital Object | D1 Digital Object | PE |
| [PP21](#_pp21_has_S/W) | has software part (is software part of) | PE23 Volatile Software | D14 Software | PE |
| [PP23](#_pp23_has_D/S) | has dataset part (is dataset part of) | PE24 Volatile Dataset | PE18 Dataset | PE |
| P125 | Used object of type (was type of object used in) | E7 Activity | E55 Type |  |
| [PP47](#_PP47_has_protocol) | has protocol type (is protocol type of) | PE8 E-Service | PE37 Protocol Type |  |
| [P129](#_P129_is_about) | is about (is subject of) | E89 Propositional Object | E1 CRM Entity | CRM |
| [PP39](#_pp39_is_metadata) | is metadata for (has metadata) | PE22 Persistent Dataset | D1 Digital Object | PE |
| [P130](#_P130_shows_features) | shows features of (features also found on) | E70 Thing | E70 Thing | CRM |
| [PP17](#_pp17_has_snapshot) | has snapshot (is snapshot of) | PE20 Volatile Digital Object | PE19 Persistent Digital Object | PE |
| [PP22](#_pp22_has_release) | has release (is release of) | PE23 Volatile Software | PE21 Persistent Software | PE |
| [PP24](#_pp24_has_dataset) | has dataset snapshot (is dataset snapshot of) | PE24 Volatile Dataset | PE22 Persistent Dataset | PE |
| [PP46](#_PP46_brokers_access) | brokers access to (access brokered by) | PE33 E-Acces Brokering Service | PE8 E-Service |  |

# Classes

## PE1 Service

|  |  |
| --- | --- |
| **Class Label** | **PE1 Service** |
| **Subclass of** | E7 Activity |
| **Superclass of** | PE2 Hosting Service PE3 Curating Service PE8 E-Service |
| **Scope Note** | This class comprises declared offers by some instance of E39 Actor of their willingness and ability to execute an activity or series of activities at the request of another instance of E39 Actor for the specific benefit of the latter. The identity of a service therefore depends on the individual instance of E39 actor making the offer, the type of activity(ies) offered and/or the type of product resultant from such an activity(ies).  An instance of a PE1 Service begins to exist with the declaration of the ability and willingness of an instance of E39 actor to perform the particular set of activities for the benefit of another actor. The instance of PE1 Service ends when either the declared willingness or ability permanently ends.  n.b.: this means that the ability may temporarily be interrupted, such as when an actor is on vacation or where the machine on which the service relies is being repaired, without meaning that the service as such has ended. A service need not continually be running in order for it be considered to be continuous, for example a service may be defined to fall within certain working hours.  The instance of PE1 Service includes all auxiliary abilities of the same actor to execute the respective activities, but not services provided by third parties in the course of the service provisioning. |
| **Examples** | The local car repair shop’s car repair services. |

New Direct Properties:

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP2 provided by** | PE1 | E39 | Indicates the intention and willingness of an actor to carry out some service |
| **PP42 has declarative time** | PE1 | xsd:Date | Relates an instance of PE1 Service to a time span during which the service provider declares the service is, will be, has been in effect. |
| **PP45 has competency** | PE1 | PE36 | Relates an instance of PE1 Service to an instance of E36 Competency Type which it is competent to perform. |
| **PP51 has availability** | PE1 | PE39 | Relates an instance of PE2 Service to an instance of PE39 Availability Type. |

## 

## PE2 Hosting Service

|  |  |
| --- | --- |
| **Class Label** | **PE2 Hosting Service** |
| **Subclass of** | PE1 Service |
| **Superclass of** | PE 5 Digital Hosting Service |
| **Scope Note** | This class comprises declared offers by some instance of E39Actorto hold, protect and provide access to one or more objects in a generic sense, either physical or conceptual, at the request of an instance of E39 Actor, where the latter may be the initial party or a second party.  An instance of PE2 Hosting Service begins from the moment of agreement between the contracting parties that the host will carry out these holding and protection activities in order to provide access, upon request, to some instance or instances of E70 Thing for the sake of the client.  The hosting services continue so long as the hosting actor retains the ability to provide access to the object(s) to the client. The instance of hosting service ends when the host is either no longer willing or able to provide access to the objects that they undertook to hold and protect for the client. |
| **Examples** | Amazon cloud hosting of a user’s files [PE5] |

New Direct Properties:

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP4 hosts object** | PE2 | E70 | Indicates the generic relation of provision of some hosting service of an object of any kind. |

## 

## PE3 Curating Service

|  |  |
| --- | --- |
| **Class Label** | **PE3 Curating Service** |
| **Subclass of** | PE1 Service |
| **Superclass of** | PE10 Digital Curating Service |
| **Scope Note** | This class comprises declared offers by some instance of E39 Actor of their willingness and ability to engage in a series of selection and organization activities on a collection of objects according to a specified plan.  The identity of the curation service is tied to the collection of which it is the curator. A curation service comes into existence for the curation of some determinate collection taken as a whole, and is further determined in its identity by provider of the service and the plan which is adopted in order to carry out the curation. It is, in particular, the nature of the object of curation to be a collection in the sense of a plurality of objects from which parts can be added or removed without the overall identity of that collection being changed.  An instance of PE3 Curating Service begins when the curator initiates the selection and organization of a collection of objects under the declared curation plan. The curating service may take over the curation of an existing collection or begin the curation of a new collection. So as long as the curator maintains these selecting and organizing activities of these objects according to the declared plan, the curation activity is considered on-going, regardless of any particular activities or lack thereof at any one time. Should the actor no longer be willing to engage in these activities or the objects be unavailable in a permanent manner, then the instance of PE3 Curating Service is to be considered ended.  While curated objects may need to be hosted, this service may or may not be undertaken by the same actor. Therefore hosting can be documented separately and attributed to the appropriate third party actor. |
| **Examples** | Curation of the Collection of Ancient Greek Art by Nikolas Papadimitriou at the Museum of Cycladic Art |

New Direct Properties:

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP31 uses curation plan** | PE3 | PE28 | Links an instance of PE3 Curation Service with the plan that organizes this activity. |
| **PP32 curates** | PE3 | PE32 | Links an instance of PE3 Curation Service with the object or objects for which it provides curation services. |

## 

## PE5 Digital Hosting Service

|  |  |
| --- | --- |
| **Class Label** | **PE5 Digital Hosting Service** |
| **Subclass of** | PE2 Hosting Service |
| **Superclass of** | PE6 Software Hosting Service PE7 Data Hosting Service |
| **Scope Note** | This class comprises declared offers by some instance of E39Actorto hold, protect and provide access to one or more digital objects at the request of an instance of E39 Actor.  The identity of digital hosting is determined by the type of object that the host undertakes to keep and provide access to. The hosting is digital in the sense that the object being held and protected is of a digital nature. Digital hosting does not entail the running of machines and software.  An instance of PE5Digital Hosting Service begins from the moment of agreement between the contracting parties that the host will carry out these holding and protection activities in order to provide access, upon request, to some instance or instances of D1Digital Object for the sake of the client.  Digital hosting services continue so long as the hosting actor retains the ability to provide access to the hosted object(s) to the client. The instance of hosting service ends when the host is either no longer willing or able to provide access to the object or collection of objects that they undertook to hold and protect for the client. |
| **Examples** | Google Art hosting of the digital images of the collections of Mathaf: the Arab Museum of Modern Art |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP6 hosts digital object** | PE5 | D1 | Indicates the relation of provision of a hosting service of a digital object of any kind. |

## 

## PE6 Software Hosting Service

|  |  |
| --- | --- |
| **Class Label** | **PE6 Software Hosting Service** |
| **Subclass of** | PE5 Digital Hosting Service |
| **Superclass of** | PE13 Software Computing E-Service PE14 Software Delivery E-Service |
| **Scope Note** | This class comprises declared offers by some instance of E39Actor to hold and protect one or more software objects at the request of an instance of E39 Actor.  The identity of software hosting is determined by the type of object that the host undertakes to keep and provide access to. The hosting is an instance of PE6 Software Hosting Service, just in case the object or objects which are held and protected are software. Software hosting does not entail the running of machines and software.  An instance of PE6 Software Hosting Service begins from the moment of agreement between the contracting parties that the host will carry out these holding and protection activities in order to provide access, upon request, to some instance or instances of D14 Software for the sake of the client.  Digital hosting services continue so long as the hosting actor retains the ability to provide access to the hosted object(s) to the client. The instance of hosting service ends when the host is either no longer willing or able to provide access to the object or collection of objects that they undertook to hold and protect for the client. |
| **Examples** | Hosting of the “Historical Software Collection” by archive.org |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP7 hosts software object** | PE6 | D14 | Indicates the relation of provision of some hosting service of a software object. |

## 

## PE7 Data Hosting Service

|  |  |
| --- | --- |
| **Class Label** | **PE7 Data Hosting Service** |
| **Subclass of** | PE5 Digital Hosting Service |
| **Superclass of** | PE15 Data E-Service |
| **Scope Note** | This class comprises declared offers by some instance of E39Actor to hold and protect one or more datasets at the request of an instance of E39 Actor.  The identity of data hosting is determined by the type of object that the host undertakes to keep and provide access to. The hosting is an instance of PE7 Data Hosting Service, just in case the object or objects which are held and protected are dataset. Data hosting does not entail the running of machines and software.  An instance of PE7 Data Hosting Service begins from the moment of agreement between the contracting parties that the host will carry out these holding and protection activities in order to provide access, upon request, to some instance or instances of PE18 Dataset for the sake of the client.  Digital hosting services continue so long as the hosting actor retains the ability to provide access to the hosted object(s) to the client. The instance of hosting service ends when the host is either no longer willing or able to provide access to the object or collection of objects that they undertook to hold and protect for the client. |
| **Examples** | Archaeological Data Service’s Hosting of project data for the “Church Wilne Deserted Medieval Settlement, Derbyshire” |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP8 hosts dataset** | PE7 | PE18 | Indicates the relation of provision of some hosting service of a dataset object. |

## PE8 E-Service

|  |  |
| --- | --- |
| **Class Label** | **PE8 E-Service** |
| **Subclass of** | PE1 Service |
| **Superclass of** | PE13 Software Computing E-Service PE14 Software Delivery E-Service PE15 Data E-Service  PE33 E-Access Brokering Service |
| **Scope Note** | This class comprises declared offers to provide computing facilities by some instance of an E39 Actor who provisions a hardware/software setup that is able to respond to the use requests of some E39 Actor through automated receipt, manipulation and sending of data.  The identity of an instance of PE8 E-Service depends on the particular communication software it runs, the actor maintaining the service active, and the logical communication address for issuing requests to it.  An instance of PE8 E-Service comes into existence on the declaration of its offer and the making available of the service through some access point. It ceases to exist just in case the instance of E39 Actor is no longer willing or able to maintain the e-service when, for example an organization ceases to operation entirely, cancels the particular service, or is no longer able to support the software/hardware entailed. |
| **Examples** | IBM quantum computing service to quantum computing researchers  Offer of community user to SETI project of computational power as part of its grid computing effort |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP28 has designated access point** | PE8 | PE29 | Links an instance of a PE8 E-Service to the web address at which the e-service can be accessed. |
| **PP29 uses access protocol** | PE8 | D14 | Links an instance of PE8 E-Service with the instance of D14 software which encodes the access protocol by which the e-service is to be accessed. |
| **PP47 has protocol type** | PE8 | PE37 | Relates an instance of PE8 E-Service to instances of PE37 Protocol Type that classify the protocols used to access the service. |
| **PP48 uses protocol parameter** | PE8 | PE38 | Relates an instance of PE8 E-Service to instances of PE35 Schema that this service requires in order to run. |
| **PP49 provides access point** | PE8 | PE29 | Relates an instance of PE8 E-Service to an instance of PE29 Access Point which the service provides for an instance of D1 Digital Object. |

## 

## PE10 Digital Curating Service

|  |  |
| --- | --- |
| **Class Label** | **PE10 Digital Curating Service** |
| **Subclass of** | PE3 Curating Service |
| **Superclass of** | PE11 Software Curating Service PE12 Data Curating Service |
| **Scope Note** | This class comprises declared offers by some instance of E39 Actor of their willingness and ability to engage in a series of selection and organization activities on an instance of PE20 Volatile Digital Object according to a specified plan.  The identity of the instance of PE10 Digital Curation Service is tied to the instance of PE20 Volatile Digital Object of which it is the curation. Instances of PE20 Volatile Digital Object are by their nature composites of different data sources. The curation activity on the volatile digital object in executing its plan for the volatile digital object - some functional goal - ensures the unity of the one volatile digital object and provides it an identity. Thus again, as with physical curation of a collection, it is normal for parts to be added or removed from the volatile digital object without its overall identity changing. It is precisely having this one object of the digital curation service that in turn allows the identification of the service itself, alongside knowledge of the curator and the plan.  An instance of PE10 Digital Curating Service begins when the curator initiates the selection and organization of a volatile digital object under the declared curation plan. The curating service may take over the curation of an existing volatile digital object or begin the curation of an entirely new volatile digital object. As long as the curator maintains the will and ability to carry out these selecting and organizing activities according to the declared plan, the curation activity is considered on-going, regardless of any particular activities or lack thereof at any one time. Should the actor no longer be willing to engage in these activities or the volatile digital object be unavailable in a permanent manner, then the instance of PE10 Digital Curating Service is to be considered ended.  While curated objects may need to be hosted, this service may or may not be undertaken by the same actor. Therefore hosting can be documented separately and attributed to the appropriate third party actor. |
| **Examples** |  |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP11 curates volatile digital object** | PE10 | PE20 | This property associates an instance of digital curating service with the digital object of which it is the curation activity. |

## 

## PE11 Software Curating Service

|  |  |
| --- | --- |
| **Class Label** | **PE11 Software Curating Service** |
| **Subclass of** | PE10 Digital Curating Service |
| **Superclass of** | PE16 Curated Software E-Service |
| **Scope Note** | This class comprises declared offers by some instance of E39 Actor of their willingness and ability to engage in a series of selection and organization activities on an instance of PE23 Volatile Software according to a specified plan.  The identity of the instance of PE11 Software Curation Service is tied to the instance of PE23 Volatile Software of which it is the curation. Instances of PE23 Volatile Software are by their nature composites of different data sources. The curation activity on the volatile software in executing its plan for the volatile software - some functional goal - ensures its unity and provides it an identity. Thus again, as with physical curation of a collection, it is normal for parts to be added or removed from the volatile software object without its overall identity changing. It is precisely having this one object of the software curation service that, in turn, allows the identification of the service itself, alongside knowledge of the curator and the plan.  An instance of PE11Software Curating Service begins when the curator initiates the selection and organization of a volatile software object under the declared curation plan. The curating service may take over the curation of an existing volatile software object or begin the curation of an entirely new volatile software object. As long as the curator maintains the will and ability to carry out these selecting and organizing activities according to the declared plan, the curation activity is considered on-going, regardless of any particular activities or lack thereof at any one time. Should the actor no longer be willing to engage in these activities or the volatile digital object be unavailable in a permanent manner, then the instance of PE11Software Curating Service is to be considered ended.  While curated objects may need to be hosted, this service may or may not be undertaken by the same actor. Therefore hosting can be documented separately and attributed to the appropriate third party actor. |
| **Examples** |  |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP12 curates volatile software** | PE11 | PE23 | This property associates an instance of software curating service with the software of which it is the curation activity. |

## PE12 Data Curating Service

|  |  |
| --- | --- |
| **Class Label** | **PE12 Data Curating Service** |
| **Subclass of** | PE10 Digital Curating Service |
| **Superclass of** | PE17 Curated Data E-Service |
| **Scope Note** | This class comprises declared offers by some instance of E39 Actor of their willingness and ability to engage in a series of selection and organization activities on an instance of PE24 Volatile Dataset according to a specified plan.  The identity of the instance of PE12 Data Curating Service is tied to the instance of PE24 Volatile Dataset of which it is the curation. Instances of PE24 Volatile Dataset are by their nature composites of different data sources. The curation activity on the volatile dataset in executing its plan for the volatile software - some functional goal - ensures its unity and provides it an identity. Thus again, as with physical curation of a collection, it is normal for parts to be added or removed from the volatile software object without its overall identity changing. It is precisely having this one object of the software curation service that, in turn, allows the identification of the service itself, alongside knowledge of the curator and the plan.  An instance of Data Curating Service begins when the curator initiates the selection and organization of a volatile dataset under the declared curation plan. The curating service may take over the curation of an existing volatile dataset or begin the curation of an entirely new volatile dataset. As long as the curator maintains the will and ability to carry out these selecting and organizing activities according to the declared plan, the curation activity is considered on-going, regardless of any particular activities or lack thereof at any one time. Should the actor no longer be willing to engage in these activities or the volatile digital object be unavailable in a permanent manner, then the instance of Data Curating Service is to be considered ended.  While curated objects may need to be hosted, this service may or may not be undertaken by the same actor. Therefore hosting can be documented separately and attributed to the appropriate third party actor. |
| **Examples** |  |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP13 curates volatile dataset** | PE12 | PE24 | This property associates an instance of data curating service with the volatile dataset of which it is the curation activity. |

## 

## PE13 Software Computing E-Service

|  |  |
| --- | --- |
| **Class Label** | **PE13 Software Computing E-Service** |
| **Subclass of** | PE6 Software Hosting Service PE8 E-Service |
| **Superclass of** | PE16 Curated Software E-Service |
| **Scope Note** | This class comprises instances of offers that are made up of both instances of PE6 Software Hosting and PE8 E-Service while additionally offering the ability and willingness to run a certain software for the requesting instance of E39 Actor. That is to say, the service provider takes on duties of hosting software, running the equipment to provide it, and delivering computing power to run it on request.  The identity of this service is likewise composite depending on those factors relevant to instances of PE6 Software Hosting Service and PE8 E-Service, while additionally requiring that we have a clear identity of the software.  The software release that the service runs may change without affecting the identity of the overall service, but to retain its identity this change would need to be documented in the access protocol, and to be archived in a log file.  If an E39 Actor provides software computing e-services that run more than one software release at the same time, each of these should be documented as a separate instance of PE13 Software Computing E-Service. The processing software is not regarded as part of the service, but as being used by the service.  An instance of PE13 Software Computing E-Service comes into existence on the declaration of its offer and the making available of the service along with the software it offers to run through some access point. It ceases to exist just in case the instance of E39 Actor is no longer willing or able to maintain the service when, for example if an organization ceases operation entirely, or the particular service is abandoned, if the software provisioned is permanently unavailable, or the host is no longer able to support the software/hardware entailed in providing the computing service. |
| **Examples** | The provisioning of Google Doc Service to clients by Google |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP14 runs on request** | PE13 | D14 | This property associates an instance of software computing e-service with the software that it runs when requested. |

## 

## PE14 Software Delivery E-Service

|  |  |
| --- | --- |
| **Class Label** | **PE14 Software Delivery E-Service** |
| **Subclass of** | PE6 Software Hosting Service PE8 E-Service |
| **Superclass of** | PE16 Curated Software E-Service |
| **Scope Note** | This class comprises instances of offers that are made up of both instances of PE6 Software Hosting and PE8 E-Service while additionally offering the ability and willingness to deliver a particular piece of software to the requesting instance of E39 Actor. That is to say, the service provider takes on duties of hosting software, running the equipment to provide it, and delivering software on demand to a client.  The identity of this service is likewise composite depending on those factors relevant to instances of PE6 Software Hosting Service and PE8 E-Service, while additionally requiring that we have a clear identity of the software to be delivered.  The software release that the service delivers may change without affecting the identity of the overall service, but to retain its identity this change would need to be documented in the access protocol, and to be archived in a log file.  If an E39 Actor provides e-services that deliver more than one software release at the same time, each of these should be documented as a separate instance of PE13 Software Computing E-Service. The processing software is not regarded as part of the service, but as being used by the service.  An instance of PE14 Software Delivery E-Service comes into existence on the declaration of its offer and the making available of the service along with the software it offers to deliver through some access point. It ceases to exist just in case the instance of E39 Actor is no longer willing or able to maintain the service when, for example if an organization ceases operation entirely, or the particular service is abandoned, if the software provisioned is permanently unavailable, or the host is no longer able to support the software/hardware entailed in providing the computing service. |
| **Examples** | The offer of Github to a client to store his/her software and deliver it to other users |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP15 delivers on request** | PE14 | D14 | This property associates an instance of software delivery e-service with the software that it delivers when requested. |

## 

## PE15 Data E-Service

|  |  |
| --- | --- |
| **Class Label** | **PE15 Data E-Service** |
| **Subclass of** | PE7 Data Hosting Service PE8 E-Service |
| **Superclass of** | PE17 Curated Data E-Service |
| **Scope Note** | This class comprises instances of offers that are made up of both instances of PE7 Data Hosting and PE8 E-Service while additionally offering the ability and willingness to offer electronic access to one or more datasets to the requesting instance of E39 Actor. That is to say, the service provider takes on duties of both hosting dataset(s) while running the equipment to provide access to the same.  The identity of this service is a composite of those factors relevant to instances of PE7Data Hosting Service and PE8 E-Service.  An instance of PE15Data E-Service comes into existence on the declaration of its offer and the making available of the service along with the dataset it aims to provide access to through some access point. It ceases to exist just in case the instance of E39 Actor is no longer willing or able to maintain the service when, for example if an organization ceases operation entirely, or the particular dataset is permanently unavailable, or the host is no longer able to support the software/hardware entailed in providing the computing service. |
| **Examples** | Offer of the British School at Athens of e-access to the digitized collection of the Byzantine Research Fund |

## 

## PE16 Curated Software E-Service

|  |  |
| --- | --- |
| **Class Label** | **PE16 Curated Software E-Service** |
| **Subclass of** | PE11 Software Curating Service PE14 Software Delivery E-Service PE13 Software Computing E-Service |
| **Superclass of** | - |
| **Scope Note** | This class comprises instances of offers that are made up of both instances of PE11 Software Curating Service and PE14S/W Delivery E-Service or PE13 Software Computing E-Service. Here then we speak of an offer both to curate some software(s), host it and running the equipment enabling its delivery to or running for clients.  The identity of an instance of PE16Curated Software E-Service depends thus on the actor providing the service, the software hosted and curated, as well as the particular processing software its E-service component runs, as well as the logical communication address for issuing requests to it. The software release the service delivers or runs may change without affecting the identity of the overall service, but to retain its identity this change would need to be documented in the access protocol, and to be archived in a log file.  An instance of PE16 Curated Software E-Service comes into existence on the declaration of its offer and the making available of the service along with the software it curates and delivers/runs through some access point. It ceases to exist just in case the instance of E39 Actor is no longer willing or able to maintain the service when, for example if an organization ceases operation entirely, or the particular service is abandoned, if the software to be hosted and curated is lost, or the host/curator is no longer able to support the software/hardware entailed in providing the delivery service. |
| **Examples** | Lyrasis offer of online hosted “Collection Space” collection management software of which they are also the developers/curators |

## 

## PE17 Curated Data E-Service

|  |  |
| --- | --- |
| **Class Label** | **PE17 Curated Data E-Service** |
| **Subclass of** | PE12 Data Curating Service PE15 Data E-Service |
| **Superclass of** | - |
| **Scope Note** | This class comprises instances of offers that are made up of both instances of PE12 Data Curating Service and PE15 Data E-Service. Here then we speak of an offer to curate some volatile dataset, host it and run the equipment necessary in order for clients to be able to access it electronically on demand.  The identity of an instance of PE17 Curated Data E-Service depends thus on the actor providing the service, the dataset hosted and curated, the particular processing software its E-service component runs, as well as the logical communication address for issuing requests to it.  An instance of PE17 Curated Data E-Service comes into existence on the declaration of its offer and the making available of the service along with the data it curates and provides access to through some access point. It ceases to exist just in case the instance of E39 Actor is no longer willing or able to maintain the service when, for example if an organization ceases operation entirely, or the particular service is abandoned, if the dataset to be hosted and curated is lost, or the host/curator is no longer able to support the software/hardware entailed in providing the delivery service. |
| **Examples** | Spotify custom crafted playlist for spotify user |

## 

## PE18 Dataset

|  |  |
| --- | --- |
| **Class Label** | **PE18 Dataset** |
| **Subclass of** | D1 Digital Object |
| **Superclass of** | PE22 Persistent Dataset PE24 Volatile Dataset |
| **Scope Note** | This class comprises identifiable immaterial items that can be represented as sets of bit sequences and whose content contains propositions about the objective world.  The identity of an instance of PE18 is determined by its content in bit level encoding alongside its provenance. Any instance of a dataset may be composed of many distinct parts of other identifiable datasets. An aggregate of instances of PE18 dataset is treated as one instance and its parts can be documented as having a part of relation (p106).  Datasets in practice are either volatile or persistent. |
| **Examples** | The collections database of the Qatar Museum Authority  A 3D model of the Asinou Church in Crete |

## 

## PE19 Persistent Digital Object

|  |  |
| --- | --- |
| **Class Label** | **PE19 Persistent Digital Object** |
| **Subclass of** | D1 Digital Object |
| **Superclass of** | PE21 Persistent Software PE22 Persistent Dataset |
| **Scope Note** | This class comprises instances of D1 digital object which are the result of a distinct creation moment in which the whole of the content of the digital object as a propositional set was established and encoded at a bit level, whether this creation moment is known or not.  Persistent digital objects are thus identified by their content, bit level encoding and the moment of production as a whole unit of information.  An instance of persistent digital object continues to exist so long as one copy of it remains on one carrier which has been maintained without change to its internal content, thus propagating the original condition of the instance. |
| **Examples** | Version 5.2 of Microsoft DOS  Backup file of the shared drive at FORTH  Submitted copy of deliverable 5.1 in word format |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP16 has persistent digital object part** | PE19 | PE19 | This property associates an instance of PE19 Persistent Digital Object with a structural part of that instance which is, in turn, also an instance of PE19 Persistent Object.  An instance of PE19 Persistent Digital Object can only have parts which are themselves also instances of PE19. This is in juxtaposition to PE20 Volatile Digital Object which may have parts which are themselves either instances of P20 Volatile Digital Object or P19 Persistent Digital Object. |

## PE20 Volatile Digital Object

|  |  |
| --- | --- |
| **Class Label** | **PE20 Volatile Digital Object** |
| **Subclass of** | PE32 Curated Thing D1 Digital Object |
| **Superclass of** | PE23 Volatile Software PE24 Volatile Dataset |
| **Scope Note** | This class comprises instances of digital objects whose content is subject to continuous change without notice or necessary archiving of intermediate state but which can be considered as one with regards to its provenance in some curation plan that determines its information, goal and subject coverage.  At any one point, an instance of PE20 Volatile Digital Object can be identified by an official snapshot of the actual data stream, an instance of PE19 Persistent Digital Object, taken by the responsible curating authority which has as ancestors any previous snapshots taken of the data stream. The curator assigns a persistent identifier to the official snapshot and is the only individual who can identify the true representative snapshot.  Reference to the content of an instance of PE20 Volatile Digital Object is down by way of the official snapshot. |
| **Examples** | The catalogue of iTunes Store music offerings  The Archive of Archaeological Data Service UK |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP17 has snapshot** | PE20 | PE19 | This property associates an instance of PE20 Volatile Digital Object with an instances of PE19 Persistent Object which at any one point stands as an official version of the overall data stream. |
| **PP18 has digital object part** | PE20 | D1 | This property associates an instance of PE20 Volatile Digital Object with a structural part of that instance. This structural part may be another instance of D1 Digital object, be it also a PE20 Volatile Digital Object or in fact be an instance of PE19 Persistent Object. |

## 

## PE21 Persistent Software

|  |  |
| --- | --- |
| **Class Label** | **PE21 Persistent Software** |
| **Subclass of** | D14 Software PE19 Persistent Digital Object |
| **Superclass of** |  |
| **Scope Note** | This class compromises instances of digital objects that that can be executed on a computer to perform specific operations. In particular, an instance of PE21 Persistent software is the necessary information to process datasets algorithmically and to transform or integrate datasets in a collaborative infrastructure. The identity of a software depends on its content on the bit-level of encoding.  The validity of the results produced by the software’s application depends categorically on its algorithmic correctness. A software release is defined as an instance of software. The software release begins to exist with its provision by the actor who is responsible for producing it.  We also include in this category all data structures and formal ontologies that are used to configure the behavior of the software at an infrastructure component level. |
| **Examples** | Sketchup |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP19 has persistent software part** | P21 | P21 | This property associates an instance of PE21 Persistent Software with a structural part of that instance which is, in turn, also an instance of PE21 Persistent Software. |

## 

## PE22 Persistent Dataset

|  |  |
| --- | --- |
| **Class Label** | **PE22 Persistent Dataset** |
| **Subclass of** | PE18 Dataset PE19 Persistent Digital Object |
| **Superclass of** |  |
| **Scope Note** | This class compromises datasets that contain collections of data, records or information kept as a persistent unit of information in the knowledge generation process from primary records up to any level of aggregation or integration.  The identity of a dataset is given by its content on the bit-level of encoding and its provenance. Since large datasets have a very small chance to be “reinvented” with another meaning, it is often practical to base the identity of a dataset on the content only, and apply a respective disambiguation of provenance only in case of obviously accidental identity. Different versions of a dataset are regarded as different datasets. Their relation should be defined by metadata describing the derivation process, rather than by version numbers.  In general, a dataset may be integrated from different sources of provenance, such as a corpus of inscriptions compiled from different publication or a snapshot of a complete digital library. The integrated dataset may preserve the units of information of the source from which it has taken components. The content of knowledge organization systems, such as gazetteers, author lists, thesauri and formal ontologies of terms at a particular point in time, fall under datasets. |
| **Examples** | Records of the Excavations at 198 High Street, Exeter (Exeter archive site 55) |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP20 has persistent dataset part** | PE22 | PE22 | This property associates an instance of PE22 Persistent Dataset with a structural part of that instance which is, in turn, also an instance of PE22 Persistent Dataset. |
| **PP39 is metadata for** | PE22 | D1 | Relates an instance of PE22 Persistent Dataset to some other instance of D1 Digital Object for which it plays the role of metadata. This relation establishes that the function of the information contained in the domain instance of PE22 is to describe the information contained in the range instance of D1. |

## 

## PE23 Volatile Software

|  |  |
| --- | --- |
| **Class Label** | **PE23 Volatile Software** |
| **Subclass of** | D14 Software PE20 Volatile Digital Object |
| **Superclass of** |  |
| **Scope Note** | This class comprise software that is in the process of active development volatile software class is comprised of instances of the working copy of some software in development. The software in development is the necessary information to perform specific operations.  The identity of an instance of PE23 Volatile Software depends on the unity provided it by the instance of PE11 Software Curating Service responsible for it, that provides it its unity of purpose. The PE11 Software Curating Service is responsible for the creation of instances of PE21 Persistent Software which are the official release of this development stream and the ability to find and run its instructions at some time. |
| **Examples** | Source code of development of Sketchup |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP21 has software part** | PE23 | D14 | This property associates an instance of PE23 Volatile Software with a structural part of that instance. This structural part will be an instance of D14 Software and can be either of its subclasses, PE21 Persistent Software of PE23 Volatile Software. |
| **PP22 has release** | PE23 | PE21 | This property associates an instance of PE23 Volatile Software with an instances of PE21 Persistent Software which at any one point stands as an official version of that software development stream. |

## 

## PE24 Volatile Dataset

|  |  |
| --- | --- |
| **Class Label** | **PE24 Volatile Dataset** |
| **Subclass of** | PE18 Dataset PE20 Volatile Digital Object |
| **Superclass of** |  |
| **Scope Note** | This class comprises datasets that are changed without notice or archiving of intermediate states but maintained by an instance of PE12 Data Curating Service.  The identity of a volatile dataset is enabled by the unity given to it by curation programme that operates on it, that bequeaths the volatile dataset common information goal and subject coverage. In order for an instance of PE24 Volatile Dataset to be referenceable it is necessary for the official curator to take snapshots, creating instances of PE22 Persistent Data Set which can be assigned and official identifier and referenced.  Volatile datasets are typically whole databases or mash-ups with active data feeds. |
| **Examples** | Ancient World Online Blogspot curated by Charles Jones |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP23 has dataset part** | PE24 | PE18 | Indicates the datasets, volatile or persistent, that form part of the volatile dataset |
| **PP24 has dataset snapshot** | PE24 | PE22 | Indicates the representative snapshot of the volatile dataset created at some point to stand as an identifier for the whole volatile dataset |
| **PP41 is index of** | PE24 | D1 | Relates an instance of PE24 to an instance of D1 Digital object in the capacity of being an index for the latter. |

## 

## PE25 RI Consortium

|  |  |
| --- | --- |
| **Class Label** | **PE25 RI Consortium** |
| **Subclass of** | PE34\_Team |
| **Superclass of** |  |
| **Scope Note** | This class comprises special groups of actors who come together for the purpose of supporting a research infrastructure project. An RI Consortium can be composed of all other types of actors including other RI Consortiums.  An RI Consortium is identified by its commonality of purpose and not by its membership at any one time.  The group comes into existence with the agreement to maintain some collective project. So long as the group continues to support the common RI project and is non-empty the consortium continues to exist. |
| **Examples** | Parthenos Consortium  Ariadne Consortium  Clarin Consortium |

## PE26 RI Project

|  |  |
| --- | --- |
| **Class Label** | **PE26 RI Project** |
| **Subclass of** | PE35\_Project |
| **Superclass of** |  |
| **Scope Note** | This class comprises instances of collaborative enterprise undertaken over a period of time by an instance of PE25 RI Consortium with the intention of supporting research activities by providing a number of services to instances of E39 Actor. The project’s existence depends on the continued maintenance by some consortium. It ends when there is no consortium left to maintain it. |
| **Examples** | Parthenos Project  Ariadne Project  Clarin Project |
|  |  |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP1 currently offers** | PE26 | PE1 | Allows research infrastructure project to be linked to the services it presently offers. |
| **PP25 has maintaining RI** | PE26 | PE25 | This property indicates the relation that exists between an instance of PE25 RI Consortium and some instance of PE26 RI Project, where the instance of PE25 is the responsible group of actors who maintain and support the instance of PE26. |

## PE28 Curation Plan

|  |  |
| --- | --- |
| **Class Label** | **PE28 Curation Plan** |
| **Subclass of** | E29 Design or Procedure |
| **Superclass of** |  |
| **Scope Note** | This class comprises instances of plans that guide curation projects and which provide the information necessary to understand the intention and overall aim of an actor in carrying out some instances of PE3 Curating Service. |
| **Examples** |  |

## 

## PE29 Access Point

|  |  |
| --- | --- |
| **Class Label** | **PE29 Access Point** |
| **Subclass of** | E51 Contact Point |
| **Superclass of** |  |
| **Scope Note** | This class comprises instances of web addresses and network addresses by which e-services can be accessed. |
| **Examples** |  |

## 

## PE32 Curated Thing

|  |  |
| --- | --- |
| **Class Label** | **PE32 Curated Thing** |
| **Subclass of** | E70 Thing |
| **Superclass of** | E78 Curated Holding PE20 Volatile Digital Object |
| **Scope Note** | This class comprises aggregations of instances of either E18 Physical Thing or of PE20 Volatile Digital Object that are assembled and maintained by one or more instances of E39 Actor over time for a specific purpose and audience, and according to a particular collection development plan.  Items may be added or removed from an instance of P32 Curated Thing in pursuit of this plan. The instance of PE32 Curated Thing gets identity not through a physical togetherness of things, nor through a concatenation of information objects, but rather through the deliberate management of the curated thing according to a plan. |
| **Examples** |  |

## PE33 E-Access Brokering Service

|  |  |
| --- | --- |
| **Class Label** | **PE33 E-Access Brokering Service** |
| **Subclass of** | PE8 E-Service |
| **Superclass of** | - |
| **Scope Note** | This class comprises declared offers by some instance of E39 Actor of their willingness and ability to provide electronic access brokering services for another instance of E39 Actor. E-Access brokering services offer mediation between the user of this instance of PE33 and some instance of PE8 E-Service, providing the means for the user to access the specified service. The actual E-Access brokering service function as an automatic process, and is indicated by the link to an instance of PE8 E-Service which is the service to which it gives access.  An instance of a PE33 Access Brokering Service begins to exist with the declaration of the ability and willingness of an instance of E39 actor to broker access to some instance of PE8 E-Service. The instance of PE3 Access Brokering Service ends when either the declared willingness or ability to effectuate the mediation between the user and the target service permanently ends. |
| **Examples** |  |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP46 brokers access to** | PE33 | PE8 | Relates an instance of PE33 E-Access Brokering Service to instances an instance of PE8 E-Service which is a service to which it brokers access. |

## PE34 Team

|  |  |
| --- | --- |
| **Class Label** | **PE34 Team** |
| **Subclass of** | E74 Group |
| **Superclass of** | PE25 RI Consortium |
| **Scope Note** | This class comprises groups of actors who come together for some defined project. The identity of the team is given by the collective will to achieve and support some project/aim. Membership in the group is determined by official association to the team for the purpose of contributing to the achievement of its aim. Membership need not be mediated by institutional association.  An instance of PE34 Team is identified by its commonality of purpose and not by its membership at any one time.  A PE34 Team instance comes into existence with the agreement to maintain its collective project. So long as the will to maintance the project is upheld by a minimal membership of the team (1), the team can be said to exist, although any or all of its members may change over time. |
| **Examples** |  |

## PE35 Project

|  |  |
| --- | --- |
| **Class Label** | **PE35 Project** |
| **Subclass of** | E7 Activity |
| **Superclass of** | PE26 RI Project |
| **Scope Note** | This class comprises instances of collaborative enterprise undertaken over a period of time by an instance of PE35 Team with the intention of effecuating some defined programme entailing the support of a number of instances of E7 Activity.  An instance of PE35 Project comes into being with the formation of an instance of PE34 Team whose aim it is to carry out and maintain the project. The project continues to exist so long as the team both exists and continues to exercise its agency towards the maintenance of this project. A project ends either when it has reached its declared end point, attained its goal or the team constituted to support it is dissolved with no successor specified. |
| **Examples** |  |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP43 supports project activity** | PE35 | E7 | Relates an instance of PE35 Project to an instance of E7 Activity which it supports as part of its overall program. |
| **P44 has maintaining team** | PE35 | PE34 | Relates an instance of PE35 Project to an instance of E34 Team which is the supporting agency that facilitates it. |

## 

## PE36 Competency Type

|  |  |
| --- | --- |
| **Class Label** | **PE36 Competency Type** |
| **Subclass of** | E55 Type |
| **Superclass of** |  |
| **Scope Note** | This class comprises concepts that are used to classify the processes or actions that a service is supposed to be capable of carrying out. |
| **Examples** |  |

## 

## PE37 Protocol Type

|  |  |
| --- | --- |
| **Class Label** | **PE37 Protocol Type** |
| **Subclass of** | E55 Type |
| **Superclass of** |  |
| **Scope Note** | This class comprises concepts that are used to classify the protocols that are used to access an instance of PE8 E-Service. |
| **Examples** |  |

## 

## PE38 Schema

|  |  |
| --- | --- |
| **Class Label** | **PE38 Schema** |
| **Subclass of** | D14 Software |
| **Superclass of** |  |
| **Scope Note** | This class is used to document instances of data structures, including formal ontologies that are used to configure the behavior of software. |
| **Examples** | * The Pico XML schema * The SQL Schema for a relational database |

## 

## PE39 Availability Type

|  |  |
| --- | --- |
| **Class Label** | **PE39 Availability Type** |
| **Subclass of** | E55 Type |
| **Superclass of** |  |
| **Scope Note** | This class comprises concepts that are used to indicate the availability of a service in terms of kinds of time interval. |
| **Examples** | 24 hours, Sporadic, On-Request |

## PE40 Programing Language

|  |  |
| --- | --- |
| **Class Label** | **PE40 Programing Language** |
| **Subclass of** | E55 Type |
| **Superclass of** |  |
| **Scope Note** | This class comprises instances of programming languages used for the creation of software. |
| **Examples** |  |

## 

## PE41 Award Activity

|  |  |
| --- | --- |
| **Class Label** | **PE41 Award Activity** |
| **Subclass of** | E7 Activity |
| **Superclass of** | PE42 Funding Activity |
| **Scope Note** | Awarding is a type of intentional event. We further restrict its intention to the type that is planned and involves an awarder, awardee, some award and perhaps a motivating reason. We are here at the level of the ‘gift’. |
| **Examples** |  |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP53 had awarder** | PE41 | E39 | Links the instance of award activity to the agent responsible for bestowing the award. |
| **PP54 had awardee** | PE41 | E39 | Links the instance of award activity to the agent bestowed the award. |
| **PP55 awarded** | PE41 | E70 | Links the instance of award activity to the object be it physical or conceptual that was awarded. |
| **PP56 awarded for** | PE41 | E1 | Links the instance of award activity to the entity that was the reason for the granting of the award. |

## 

## PE42 Funding Activity

|  |  |
| --- | --- |
| **Class Label** | **PE42 Funding Activity** |
| **Subclass of** | PE41 Award Activity |
| **Superclass of** |  |
| **Scope Note** | Funding is a type of intentional event. We further restrict its intention to the type that is planned and involves a funder, fundee, some monetary amount and perhaps a motivating reason. We are here at the level of exchange. This kind of activity can be seen as a specialization of award activity, that restricts the circuit of reward. |
| **Examples** |  |

New Direct Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP57 provided funding amount** | PE42 | E97 | Links the instance of funding activity to the monetary amount awarded. |

## PE43 Encoding Type

|  |  |
| --- | --- |
| **Class Label** | **PE43 Encoding Type** |
| **Subclass of** | E55 Type |
| **Superclass of** |  |
| **Scope Note** | This class comprises concepts that are used to classify kinds of encoding used in the creation of digital objects. |
| **Examples** |  |

## PE44 Audience Type

|  |  |
| --- | --- |
| **Class Label** | **PE44 Audience Type** |
| **Subclass of** | E55 Type |
| **Superclass of** |  |
| **Scope Note** | This class comprises concepts that are used to classify kinds of audience. |
| **Examples** |  |

# Relations

## PP1 currently offers (currently offered by)

|  |  |
| --- | --- |
| **Relation Label** | **PP1 currently offers (is currently offered by)** |
| **Subrelation of** | P9 consists of (forms part of) |
| **Superrelation of** | - |
| **Domain** | PE26 RI Project |
| **Range** | PE1 Service |
| **Scope** | Allows research infrastructure project to be linked to the services it presently offers |
| **Examples** |  |

## 

## PP2 provided by (provides)

|  |  |
| --- | --- |
| **Relation Label** | **PP2 provided by (provides)** |
| **Subrelation of** | P14 carried out by (performed) |
| **Superrelation of** | - |
| **Domain** | PE1 Service |
| **Range** | E39 Actor |
| **Scope** | Indicates the intention and willingness of an actor to carry out some service |
| **Examples** |  |

## 

## PP4 hosts object (is object hosted by)

|  |  |
| --- | --- |
| **Relation Label** | **PP4 hosts object (is object hosted by)** |
| **Subrelation of** | P16 used specific object (was used for) |
| **Superrelation of** | PP6 hosts digital object (is digital object hosted by) |
| **Domain** | PE2 Hosting Service |
| **Range** | E70 Thing |
| **Scope** | Indicates the generic relation of provision of some hosting service of an object of any kind. |
| **Examples** |  |

## 

## PP6 hosts digital object (is digital object hosted by)

|  |  |
| --- | --- |
| **Relation Label** | **PP6 hosts digital object (is digital object hosted by)** |
| **Subrelation of** | PP4 hosts object (is object hosted by) |
| **Superrelation of** | PP7 hosts software object (is software object hosted by) PP8 hosts dataset (is dataset hosted by) |
| **Domain** | PE5 Digital Hosting Service |
| **Range** | D1 Digital Object |
| **Scope** | Indicates the relation of provision of a hosting service of a digital object of any kind. |
| **Examples** |  |

## 

## PP7 hosts software object (is software object hosted by)

|  |  |
| --- | --- |
| **Relation Label** | **PP7 hosts software object (is software object hosted by)** |
| **Subrelation of** | PP6 hosts digital object (is digital object hosted by) |
| **Superrelation of** | - |
| **Domain** | PE6 Software Hosting Service |
| **Range** | D14 Software |
| **Scope** | Indicates the relation of provision of some hosting service of a software object. |
| **Examples** |  |

## 

## PP8 hosts dataset (is dataset hosted by)

|  |  |
| --- | --- |
| **Relation Label** | **PP8 hosts dataset (is dataset hosted by)** |
| **Subrelation of** | PP6 hosts digital object (is digital object hosted by) |
| **Superrelation of** | - |
| **Domain** | PE7 Data Hosting Service |
| **Range** | PE18 Dataset |
| **Scope** | Indicates the relation of provision of some hosting service of a dataset object. |
| **Examples** |  |

## 

## PP11 curates volatile digital object (is volatile digital object curated by)

|  |  |
| --- | --- |
| **Relation Label** | **PP11 curates volatile digital object (is volatile digital object curated by)** |
| **Subrelation of** | PP32 curates (is curated by) |
| **Superrelation of** | PP12 curates volatile software (is volatile software curated by) PP13 curates volatile dataset (is volatile dataset curated by) |
| **Domain** | PE10 Digital Curating Service |
| **Range** | PE20 Volatile Digital Object |
| **Scope** | This property associates an instance of digital curating service with the digital object of which it is the curation activity. |
| **Examples** |  |

## 

## PP12 curates volatile software (is volatile software curated by)

|  |  |
| --- | --- |
| **Relation Label** | **PP12 curates volatile software (is volatile software curated by)** |
| **Subrelation of** | PP11 curates volatile digital object (is volatile digital object curated by) |
| **Superrelation of** | - |
| **Domain** | PE11 Software Curating Service |
| **Range** | PE23 Volatile Software |
| **Scope** | This property associates an instance of software curating service with the software of which it is the curation activity. |
| **Examples** |  |

## 

## PP13 curates volatile dataset (is volatile dataset curated by)

|  |  |
| --- | --- |
| **Relation Label** | **PP13 curates volatile dataset (is volatile dataset curated by)** |
| **Subrelation of** | PP11 curates volatile digital object (is volatile digital object curated by) |
| **Superrelation of** | - |
| **Domain** | PE12 Data Curating Service |
| **Range** | PE24 Volatile Dataset |
| **Scope** | This property associates an instance of data curating service with the volatile dataset of which it is the curation activity. |
| **Examples** |  |

## PP14 runs on request (is run by)

|  |  |
| --- | --- |
| **Relation Label** | **PP14 runs on request (is run by)** |
| **Subrelation of** | P16 used specific object (was used for) |
| **Superrelation of** | - |
| **Domain** | PE13 Software Computing E-Service |
| **Range** | D14 Software |
| **Scope** | This property associates an instance of software computing e-service with the software that it runs when requested  . |
| **Examples** |  |

## 

## PP15 delivers on request (is delivered by)

|  |  |
| --- | --- |
| **Relation Label** | **PP15 delivers on request (is delivered by)** |
| **Subrelation of** | P16 used specific object (was used for) |
| **Superrelation of** | - |
| **Domain** | PE14 Software Delivery E-Service |
| **Range** | D14 Software |
| **Scope** | This property associates an instance of software delivery e-service with the software that it delivers when requested. |
| **Examples** |  |

## 

## PP16 has persistent digital object part (is persistent digital object part of)

|  |  |
| --- | --- |
| **Relation Label** | **PP16 has persistent digital object part (is persistent digital object part of)** |
| **Subrelation of** | P106 is composed of (forms part of) |
| **Superrelation of** | PP19 has persistent software part (is persistent software part of) PP20 has persistent dataset part (is persistent dataset part of) |
| **Domain** | PE19 Persistent Digital Object |
| **Range** | PE19 Persistent Digital Object |
| **Scope** | This property associates an instance of PE19 Persistent Digital Object with a structural part of that instance which is, in turn, also an instance of PE19 Persistent Object.  An instance of PE19 Persistent Digital Object can only have parts which are themselves also instances of PE19. This is in juxtaposition to PE20 Volatile Digital Object which may have parts which are themselves either instances of P20 Volatile Digital Object or P19 Persistent Digital Object. |
| **Examples** |  |

## PP17 has snapshot (is snapshot of)

|  |  |
| --- | --- |
| **Relation Label** | **PP17 has snapshot (is snapshot of)** |
| **Subrelation of** | P130 shows features of (features are also found on) |
| **Superrelation of** | PP22 has release (is release of) PP24 has dataset snapshot (is dataset snapshot of) |
| **Domain** | PE20 Volatile Digital Object |
| **Range** | P19 Persistent Digital Object |
| **Scope** | This property associates an instance of PE20 Volatile Digital Object with an instances of PE19 Persistent Object which at any one point stands as an official version of the overall data stream. |
| **Examples** |  |

## 

## PP18 has digital object part (is digital object part of)

|  |  |
| --- | --- |
| **Relation Label** | **PP18 has digital object part (is digital object part of)** |
| **Subrelation of** | P106 is composed of (forms part of) |
| **Superrelation of** | PP21 has software part (is software part of) PP23 has dataset part (is dataset part of) |
| **Domain** | PE20 Volatile Digital Object |
| **Range** | D1 Digital Object |
| **Scope** | This property associates an instance of PE20 Volatile Digital Object with a structural part of that instance. This structural part may be another instance of D1 Digital object, be it also a PE20 Volatile Digital Object or in fact be an instance of PE19 Persistent Object. |
| **Examples** |  |

## 

## PP19 has persistent software part (is persistent software part of)

|  |  |
| --- | --- |
| **Relation Label** | **PP19 has persistent software part (is persistent software part of)** |
| **Subrelation of** | PP16 has persistent digital object part (is persistent digital object part of) |
| **Superrelation of** | - |
| **Domain** | PE21 Persistent Software |
| **Range** | PE21 Persistent Software |
| **Scope** | This property associates an instance of PE21 Persistent Software with a structural part of that instance which is, in turn, also an instance of PE21 Persistent Software. |
| **Examples** |  |

## PP20 has persistent dataset part (is persistent dataset part of)

|  |  |
| --- | --- |
| **Relation Label** | **PP20 has persistent dataset part (is persistent dataset part of)** |
| **Subrelation of** | PP16 has persistent digital object part (is persistent digital object part of) |
| **Superrelation of** | - |
| **Domain** | PE22 Persistent Dataset |
| **Range** | PE22 Persistent Dataset |
| **Scope** | This property associates an instance of PE22 Persistent Dataset with a structural part of that instance which is, in turn, also an instance of PE22 Persistent Dataset. |
| **Examples** |  |

## 

## PP21 has software part (is software part of)

|  |  |
| --- | --- |
| **Relation Label** | **PP21 has software part (is software part of)** |
| **Subrelation of** | PP18 has digital object part (is digital object part of) |
| **Superrelation of** | - |
| **Domain** | PE23 Volatile Software |
| **Range** | D14 Software |
| **Scope** | This property associates an instance of PE23 Volatile Software with a structural part of that instance. This structural part will be an instance of D14 Software and can be either of its subclasses, PE21 Persistent Software of PE23 Volatile Software. |
| **Examples** |  |

## 

## PP22 has release (is release of)

|  |  |
| --- | --- |
| **Relation Label** | **PP22 has release (is release of)** |
| **Subrelation of** | PP17 has snapshot (is snapshot of) |
| **Superrelation of** | - |
| **Domain** | PE23 Volatile Software |
| **Range** | PE21 Persistent Software |
| **Scope** | This property associates an instance of PE23 Volatile Software with an instances of PE21 Persistent Software which at any one point stands as an official version of that software development stream. |
| **Examples** |  |

## PP23 has dataset part (is dataset part of)

|  |  |
| --- | --- |
| **Relation Label** | **PP23 has dataset part (is dataset part of)** |
| **Subrelation of** | PP18 has digital object part (is digital object part of) |
| **Superrelation of** | - |
| **Domain** | PE24 Volatile Dataset |
| **Range** | PE18 Dataset |
| **Scope** | This property associates an instance of PE24 Volatile Dataset with a structural part of that instance. This structural part will be an instance of PE18 Dataset and can be either of its subclasses, PE22 Persistent Dataset of PE24 Persistent Dataset. |
| **Examples** |  |

## 

## PP24 has dataset snapshot (is dataset snapshot of)

|  |  |
| --- | --- |
| **Relation Label** | **PP24 has dataset snapshot (is dataset snapshot of)** |
| **Subrelation of** | PP17 has snapshot (is snapshot of) |
| **Superrelation of** | - |
| **Domain** | PE24 Volatile Dataset |
| **Range** | PE22 Persistent Dataset |
| **Scope** | This property associates an instance of PE24Volatile Dataset with an instance of PE22 Persistent Dataset which at any one point stands as an official version of that dataset. |
| **Examples** |  |

## 

## PP25 has maintaining RI (is maintaining RI of)

|  |  |
| --- | --- |
| **Relation Label** | **PP25 has maintaining RI (is maintaining RI of)** |
| **Subrelation of** | PP44 has maintaining team (is maintaining team of) |
| **Superrelation of** | - |
| **Domain** | PE26 RI Project |
| **Range** | PE25 RI Consortium |
| **Scope** | This property indicates the relation that exists between an instance of PE25 RI Consortium and some instance of PE26 RI Project, where the instance of PE25 is the responsible group of actors who maintain and support the instance of PE26. |
| **Examples** |  |

## 

## PP28 has designated access point (is designated access point of)

|  |  |
| --- | --- |
| **Relation Label** | **PP28 has designated access point (is designated access point of)** |
| **Subrelation of** | P1 is identified by (identifies) |
| **Superrelation of** | - |
| **Domain** | PE8 E-Service |
| **Range** | PE29 Access Point |
| **Scope** | Links an instance of a PE8 E-Service to the web address at which the e-service can be accessed. |
| **Examples** |  |

## 

## PP29 uses access protocol (is access protocol used by)

|  |  |
| --- | --- |
| **Relation Label** | **PP29 uses access protocol (is access protocol used by)** |
| **Subrelation of** | P16 used specific object (was used for) |
| **Superrelation of** | - |
| **Domain** | PE8 E-Service |
| **Range** | D14 Software |
| **Scope** | Links an instance of PE8 E-Service with the instance of D14 software which encodes the access protocol by which the e-service is to be accessed. |
| **Examples** |  |

## 

## PP31 uses curation plan (is curation plan used by)

|  |  |
| --- | --- |
| **Relation Label** | **PP31 uses curation plan (is curation plan used by)** |
| **Subrelation of** | P33 used specific technique (was used by) |
| **Superrelation of** | - |
| **Domain** | PE3 Curating Service |
| **Range** | PE28 Curation Plan |
| **Scope** | Links an instance of PE3 Curation Service with the plan that organizes this activity |
| **Examples** |  |

## 

## PP32 curates (is curated by)

|  |  |
| --- | --- |
| **Relation Label** | **PP32 curates (is curated by)** |
| **Subrelation of** |  |
| **Superrelation of** | P147 curated (was curated by) PP11 curates volatile digital object (is volatile D/O curated by) |
| **Domain** | PE3 Curating Service |
| **Range** | PE32 Curated Thing |
| **Scope** | Links an instance of PE3 Curation Service with the object or objects for which it provides curation services. |
| **Examples** |  |

## 

## PP39 is metadata for (has metadata)

|  |  |
| --- | --- |
| **Relation Label** | **PP39 is metadata for (has metadata)** |
| **Subrelation of** | P129 is about (is subject of) |
| **Superrelation of** | - |
| **Domain** | PE22 Persistent Dataset |
| **Range** | D1 Digital Object |
| **Scope** | Relates an instance of PE22 Persistent Dataset to some other instance of D1 Digital Object for which it plays the role of metadata. This relation establishes that the function of the information contained in the domain instance of PE22 is to described the information contained in the range instance of D1. |
| **Examples** |  |

## PP40 created successor of (is deprecated by)

|  |  |
| --- | --- |
| **Relation Label** | **PP40 created successor of (is deprecated by)** |
| **Subrelation of** | P16 used specific object (was used for) |
| **Superrelation of** | - |
| **Domain** | E65 Creation |
| **Range** | PE22 Persistent Dataset |
| **Scope** | Relates an instance of E65 Creation to an instance of E22 Persistent Dataset that is acting as a metadata set. The latter E22 Persistent Dataset is referred to in the act of creation, specifically as the object of some correction. It is thus deprecated in the act of creation of some new instance of E22 Persistent Dataset. The new instance can be considered the successor of this deprecated dataset. The most recent successor, all things being equal, represents the present state of knowledge. |
| **Examples** |  |

## PP41 is index of (is indexed by)

|  |  |
| --- | --- |
| **Relation Label** | **PP41 is index of (is indexed by)** |
| **Subrelation of** |  |
| **Superrelation of** | - |
| **Domain** | PE24 Volatile Dataset |
| **Range** | D1 Digital Object |
| **Scope** | Relates an instance of PE24 to an instance of D1 Digital object in the capacity of being an index for the latter. |
| **Examples** |  |

## PP42 has declarative time

|  |  |
| --- | --- |
| **Relation Label** | **PP42 has declarative time** |
| **Subrelation of** |  |
| **Superrelation of** | - |
| **Domain** | PE1 Service |
| **Range** | E61 Time Primitive (xsd:Date in the rdf encoding) |
| **Scope** | Relates an instance of PE1 Service to a time span during which the service provider declares the service is, will be, has been in effect. |
| **Examples** |  |

## PP43 supports project activity (is project activity supported by)

|  |  |
| --- | --- |
| **Relation Label** | **PP43 supported project activity (is project activity supported by)** |
| **Subrelation of** | P9 consists of (forms part of) |
| **Superrelation of** | - |
| **Domain** | PE35 Project |
| **Range** | E7 Activity |
| **Scope** | Relates an instance of PE35 Project to an instance of E7 Activity which it supports as part of its overall program. |
| **Examples** |  |

## PP44 has maintaining team (is maintaining team of)

|  |  |
| --- | --- |
| **Relation Label** | **PP44 has maintaining team (is maintaining team of)** |
| **Subrelation of** | P17 was motivated by (motivated) |
| **Superrelation of** | PP26 has maintaining RI (is maintaining RI of) |
| **Domain** | PE35 Project |
| **Range** | PE34 Team |
| **Scope** | Relates an instance of PE35 Project to an instance of E34 Team which is the supporting agency that facilitates it. |
| **Examples** |  |

## 

## PP45 has competency (is competency of)

|  |  |
| --- | --- |
| **Relation Label** | **PP45 has competency (is competency of)** |
| **Subrelation of** | P21 had general purpose (was purpose of) |
| **Superrelation of** | - |
| **Domain** | PE1 Service |
| **Range** | PE36 Competency Type |
| **Scope** | Relates an instance of PE1 Service to an instance of E36 Competency Type which it is competent to perform. |
| **Examples** |  |

## 

## PP46 brokers access to (access brokered by)

|  |  |
| --- | --- |
| **Relation Label** | **PP46 brokers access to (has access brokered by)** |
| **Subrelation of** |  |
| **Superrelation of** | - |
| **Domain** | PE33 E-Access Brokering Service |
| **Range** | PE8 E-Service |
| **Scope** | Relates an instance of PE33 E-Access Brokering Service to instances an instance of PE8 E-Service which is a service to which it brokers access. |
| **Examples** |  |

## 

## PP47 has protocol type (is protocol type of)

|  |  |
| --- | --- |
| **Relation Label** | **PP47 has protocol type (is protocol type of)** |
| **Subrelation of** | P125 used object of type (was type of object used in) |
| **Superrelation of** | - |
| **Domain** | PE8 E-Service |
| **Range** | PE37 Protocol Type |
| **Scope** | Relates an instance of PE8 E-Service to instances of PE37 Protocol Type that classify the protocols used to access the service. |
| **Examples** |  |

## 

## PP48 uses protocol parameter (is protocol parameter of)

|  |  |
| --- | --- |
| **Relation Label** | **PP48 uses protocol parameter (is protocol parameter of)** |
| **Subrelation of** | P16 used specific object (was used for) |
| **Superrelation of** | - |
| **Domain** | PE8 E-Service |
| **Range** | PE38 Schema |
| **Scope** | Relates an instance of PE8 E-Service to instances of PE35 Schema that this service requires in order to run. |
| **Examples** |  |

## 

## PP49 provides access point (is access point provided by)

|  |  |
| --- | --- |
| **Relation Label** | **PP49 provides access point (is access point provided by)** |
| **Subrelation of** |  |
| **Superrelation of** | - |
| **Domain** | PE8 E-Service |
| **Range** | PE29 Access Point |
| **Scope** | Relates an instance of PE8 E-Service to an instance of PE29 Access Point which the service provides for an instance of D1 Digital Object. |
| **Examples** |  |

## 

## PP50 accessible at (provides access to)

|  |  |
| --- | --- |
| **Relation Label** | **PP50 accessible at (provides access to)** |
| **Subrelation of** |  |
| **Superrelation of** | - |
| **Domain** | D1 Digital Object |
| **Range** | PE29 Access Point |
| **Scope** | Relates an instance of D1 Digital Object to an instance of PE29 Access Point which has been provided to it by some PE8 E-Service. |
| **Examples** |  |

## 

## PP51 has availability (is availability of)

|  |  |
| --- | --- |
| **Relation Label** | **PP51 has availability (is availability of)** |
| **Subrelation of** | P2 has type (is type of) |
| **Superrelation of** | - |
| **Domain** | PE1 Service |
| **Range** | PE39 Availability Type |
| **Scope** | Relates an instance of PE2 Service to an instance of PE39 Availability Type. |
| **Examples** |  |

## 

## PP52 is programmed with (is used to programmme)

|  |  |
| --- | --- |
| **Relation Label** | **PP52 is programmed with (is used to programmme)** |
| **Subrelation of** |  |
| **Superrelation of** | - |
| **Domain** | D14 Software |
| **Range** | PE40 Programming Language |
| **Scope** | Relates an instance of D14 Software to an instance of PE40 Programming Language with which it was programmed. This property is a shortcut for the fully developed path: D14 L11i->D7->P32->E55. |
| **Examples** |  |

## 

## PP53 had awarder (was awarded by)

|  |  |
| --- | --- |
| **Relation Label** | **PP53 had awarder (was awarded by)** |
| **Subrelation of** | P14 carried out by |
| **Superrelation of** |  |
| **Domain** | PE41 Award Activity |
| **Range** | E39 Actor |
| **Scope** | Links the instance of award activity to the agent responsible for bestowing the award. |
| **Examples** |  |

## 

## PP54 had awardee (was awarded to)

|  |  |
| --- | --- |
| **Relation Label** | **PP54 had awardee (was awarded to)** |
| **Subrelation of** | P14 carried out by |
| **Superrelation of** |  |
| **Domain** | PE41 Award Activity |
| **Range** | E39 Actor |
| **Scope** | Links the instance of award activity to the agent bestowed the award. |
| **Examples** |  |

## 

## PP55 awarded (was thing awarded by)

|  |  |
| --- | --- |
| **Relation Label** | **PP55 awarded (was thing awarded by)** |
| **Subrelation of** | P16 used specific object |
| **Superrelation of** |  |
| **Domain** | PE41 Award Activity |
| **Range** | E70 Thing |
| **Scope** | Links the instance of award activity to the object be it physical or conceptual that was awarded. |
| **Examples** |  |

## 

## PP56 awarded for (was award of)

|  |  |
| --- | --- |
| **Relation Label** | **PP56 awarded for (was award of)** |
| **Subrelation of** | P17 was motivated by |
| **Superrelation of** |  |
| **Domain** | PE41 Award Activity |
| **Range** | E1 CRM Entity |
| **Scope** | Links the instance of award activity to the entity that was the reason for the granting of the award. |
| **Examples** |  |

## 

## PP57 provided funding amount (was funding provided by)

|  |  |
| --- | --- |
| **Relation Label** | **PP57 provided funding amount (was funding provided by)** |
| **Subrelation of** |  |
| **Superrelation of** |  |
| **Domain** | PE42 Funding Activity |
| **Range** | E97 Monetary Amount |
| **Scope** | Links the instance of funding activity to the monetary amount awarded.  *PP57 provided funding amount (was funding provided by)* is a shortcut of the more fully developed path from ‘*PE42 Funding Activity’* through *‘PP55 awarded’, ‘E70 Thing’, ‘P43 has dimension’*, to ‘*E97 Monetary* *Amount’* |
| **Examples** |  |

## 

## PP58 is encoded with (is encoding of)

|  |  |
| --- | --- |
| **Relation Label** | **PP58 is encoded with (is encoding of)** |
| **Subrelation of** | P2 has type |
| **Superrelation of** |  |
| **Domain** | D1 Digital Object |
| **Range** | PE43 Encoding Type |
| **Scope** | Links an instance of digital object to the type of encoding that was used in its production and can now be used in determining how to access it.  This is a shortcut of the long path 11i->D7->p33->E29->p2->E55 |
| **Examples** |  |

## PP59 had intended audience (was intended audience of)

|  |  |
| --- | --- |
| **Relation Label** | **PP59 had intended audience (was intended audience of)** |
| **Subrelation of** | P21 had general purpose |
| **Superrelation of** |  |
| **Domain** | E7 Activity |
| **Range** | PE44 Audience Type |
| **Scope** | Links an instance of E7 Activity to the audience type that it was intended to be directed at. |
| **Examples** | Greek military protection of airspace (E7) had intended audience domestic voters (E55). |

## PP60 had intended geographic scope (was intended geographic scope of)

|  |  |
| --- | --- |
| **Relation Label** | **PP60 had intended geographic scope (was intended geographic scope of)** |
| **Subrelation of** |  |
| **Superrelation of** |  |
| **Domain** | E7 Activity |
| **Range** | E53 Place |
| **Scope** | Links an instance of E7 Activity to the geographic range over which it was intended to have effect by the actor. |
| **Examples** | Greek military protection of airspace (e7) had intended geographic scope the official territory of Greece according to Lausanne Treaty (E53). |

# Referred Classes

## D1 Digital Object

|  |  |
| --- | --- |
| **Class Label** | **D1 Digital Object** |
| **Subclass of** | E73 Information Object |
| **Superclass of** | PE19 Persistent Digital Object PE20 Volatile Digital Object D14 Software PE18 Dataset |
| **Scope Note** | This class comprises identifiable immaterial items that can be represented as sets of bit sequences, such as data sets, e-texts, images, audio or video items, software, etc., and are documented as single units.  Any aggregation of instances of D1 Digital Object into a whole treated as single unit is also regarded as an instance of D1 Digital Object.  This means that for instance, the content of a DVD, an XML file on it, and an element of this file, are regarded as distinct instances of D1 Digital Object, mutually related by the P106 is composed of (forms part of) property.  A D1 Digital Object does not depend on a specific physical carrier, and it can exist on one or more carriers simultaneously. |
| **Examples** |  |
| **External Ontology Origin** | CRMdig 3.2.1 |

Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP50 accessible at** | D1 | PE29 | Relates an instance of D1 Digital Object to an instance of PE29 Access Point which has been provided to it by some PE8 E-Service. |
| **PP58 is encoded with** | D1 | PE43 | Links an instance of digital object to the type of encoding that was used in its production and can now be used in determining how to access it.  This is a shortcut of the long path 11i->D7->p33->E29->p2->E55 |

## D14 Software

|  |  |
| --- | --- |
| **Class Label** | **D14 Software** |
| **Subclass of** | D1 Digital Object |
| **Superclass of** | PE21 Persistent Software PE23 Volatile Software  PE38 Schema |
| **Scope Note** | This class comprises software codes, computer programs, procedures and functions that are used to operate a system of digital objects. |
| **Examples** |  |
| **External Ontology Origin** | CRMdig 3.2.1 |

Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP52 is programmed with** | D14 | PE40 | Relates an instance of D14 Software to an instance of PE40 Programming Language with which it was programmed. This property is a shortcut for the fully developed path:  D14 L11i->D7->P32->E55. |

## E7 Activity

|  |  |
| --- | --- |
| **Class Label** | **E7 Activity** |
| **Subclass of** | E5 Event |
| **Superclass of** | PE1 Service  PE35 Project  PE27 Service Action  PE41 Award Activity |
| **Scope Note** | This class comprises actions intentionally carried out by instances of E39 Actor that result in changes of state in the cultural, social, or physical systems documented.  This notion includes complex, composite and long-lasting actions such as the building of a settlement or a war, as well as simple, short-lived actions such as the opening of a door. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP59 had intended audience** | E7 | PE44 | Links an instance of E7 Activity to the audience type that it was intended to be directed at. |
| **PP60 had intended geographic scope** | E7 | E53 | Links an instance of E7 Activity to the geographic range over which it was intended to have effect by the actor. |

## 

## E29 Design or Procedure

|  |  |
| --- | --- |
| **Class Label** | **E29 Design or Procedure** |
| **Subclass of** | E73 Information Object |
| **Superclass of** | PE28 Curation Plan |
| **Scope Note** | This class comprises documented plans for the execution of actions in order to achieve a result of a specific quality, form or contents. In particular it comprises plans for deliberate human activities that may result in the modification or production of instances of E24 Physical Thing.  Instances of E29 Design or Procedure can be structured in parts and sequences or depend on others. This is modelled using *P69*  has association with (is associated with)..  Designs or procedures can be seen as one of the following:   1. A schema for the activities it describes 2. A schema of the products that result from their application. 3. An independent intellectual product that may have never been applied, such as Leonardo da Vinci’s famous plans for flying machines.   Because designs or procedures may never be applied or only partially executed, the CRM models a loose relationship between the plan and the respective product |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

## E39Actor

|  |  |
| --- | --- |
| **Class Label** | **E39 Actor** |
| **Subclass of** | E77 Persistent Item |
| **Superclass of** | E21 Person E74 Group |
| **Scope Note** | This class comprises people, either individually or in groups, who have the potential to perform intentional actions of kinds for which someone may be held responsible. The CRM does not attempt to model the inadvertent actions of such actors. Individual people should be documented as instances of E21 Person, whereas groups should be documented as instances of either E74 Group or its subclass E40 Legal Body. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP27 has designated contact** | PE39 | E39 | Link to the actor whom is designated as the contact point for this service (may or may not be the actor who offers the service, may or may not form a member of the group or institution that provides a service) |

## E40 Legal Body

|  |  |
| --- | --- |
| **Class Label** | **E40 Legal Body** |
| **Subclass of** | E74 Group |
| **Superclass of** | PE25 RI Consortium |
| **Scope Note** | This class comprises institutions or groups of people that have obtained a legal recognition as a group and can act collectively as agents.  This means that they can perform actions, own property, create or destroy things and can be held collectively responsible for their actions like individual people. The term 'personne morale' is often used for this in French. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

## 

## E51 Contact Point

|  |  |
| --- | --- |
| **Class Label** | **E51 Contact Point** |
| **Subclass of** | E41 Appellation |
| **Superclass of** | E45 Address PE29 Access Point |
| **Scope Note** | This class comprises identifiers employed, or understood, by communication services to direct communications to an instance of E39 Actor. These include E-mail addresses, telephone numbers, post office boxes, Fax numbers, URLs etc. Most postal addresses can be considered both as instances of E44 Place Appellation and E51 Contact Point. In such cases the subclass E45 Address should be used. URLs are addresses used by machines to access another machine through an http request.  Since the accessed machine acts on behalf of the E39 Actor providing the machine, URLs are considered as instances of E51 Contact Point to that E39 Actor. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

## E55 Type

|  |  |
| --- | --- |
| **Class Label** | **E55 Type** |
| **Subclass of** | E28 Conceptual Object |
| **Superclass of** | E56 Language  E57 Material  E58 Measurement Unit  PE36 Competency Type  PE37 Protocol Type PE39 Availability Type PE40 Programing Language PE43 Encoding TypePE44 Audience Type |
| **Scope Note** | This class comprises concepts denoted by terms from thesauri and controlled vocabularies used to characterize and classify instances of CRM classes. Instances of E55 Type represent concepts in contrast to instances of E41 Appellation which are used to name instances of CRM classes.  E55 Type is the CRM’s interface to domain specific ontologies and thesauri. These can be represented in the CRM as subclasses of E55 Type, forming hierarchies of terms, i.e. instances of E55 Type linked via P127 has broader term (has narrower term). Such hierarchies may be extended with additional properties |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

## E65 Creation

|  |  |
| --- | --- |
| **Class Label** | **E65 Creation** |
| **Subclass of** | E7 Activity |
| **Superclass of** |  |
| **Scope Note** | This class comprises events that result in the creation of conceptual items or immaterial products, such as legends, poems, texts, music, images, movies, laws, types etc. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Label** | **Domain** | **Range** | **Scope Note** |
| **PP40 created successor of** | E65 | PE22 | Indicates the relation between the act of creation and a metadata set that is corrected in the act of creation. |

## E70 Thing

|  |  |
| --- | --- |
| **Class Label** | **E70 Thing** |
| **Subclass of** | E77 Persistent Item |
| **Superclass of** | PE32 Curated Thing |
| **Scope Note** | This general class comprises discrete, identifiable, instances of E77 Persistent Item that are documented as single units, that either consist of matter or depend on being carried by matter and are characterized by relative stability.  They may be intellectual products or physical things. They may for instance have a solid physical form, an electronic encoding, or they may be a logical concept or structure. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

## 

## E71 Man Made Thing

|  |  |
| --- | --- |
| **Class Label** | **E71 Man Made Thing** |
| **Subclass of** | E70 Thing |
| **Superclass of** | E24 Physical Man-Made Thing E28 Conceptual Object |
| **Scope Note** | This class comprises discrete, identifiable man-made items that are documented as single units.  These items are either intellectual products or man-made physical things, and are characterized by relative stability. They may for instance have a solid physical form, an electronic encoding, or they may be logical concepts or structures |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.2 |

## 

## E74 Group

|  |  |
| --- | --- |
| **Class Label** | **E74 Group** |
| **Subclass of** | E39 Actor |
| **Superclass of** | E40 Legal Body PE34 Team |
| **Scope Note** | This class comprises any gatherings or organizations of E39 Actors that act collectively or in a similar way due to any form of unifying relationship. In the wider sense this class also comprises official positions which used to be regarded in certain contexts as one actor, independent of the current holder of the office, such as the president of a country. In such cases, it may happen that the Group never had more than one member. A joint pseudonym (i.e., a name that seems indicative of an individual but that is actually used as a persona by two or more people) is a particular case of E74 Group.  A gathering of people becomes an E74 Group when it exhibits organizational characteristics usually typified by a set of ideas or beliefs held in common, or actions performed together. These might be communication, creating some common artifact, a common purpose such as study, worship, business, sports, etc. Nationality can be modelled as membership in an E74 Group (cf. HumanML markup). Married couples and other concepts of family are regarded as particular examples of E74 Group. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.2 |

## E77 Persistent Item

|  |  |
| --- | --- |
| **Class Label** | **E77 Persistent Item** |
| **Subclass of** | E1 CRM Entity |
| **Superclass of** | E39 Actor E70 Thing |
| **Scope Note** | This class comprises items that have a persistent identity, sometimes known as “endurants” in philosophy.  They can be repeatedly recognized within the duration of their existence by identity criteria rather than by continuity or observation. Persistent Items can be either physical entities, such as people, animals or things, or conceptual entities such as ideas, concepts, products of the imagination or common names.  The criteria that determine the identity of an item are often difficult to establish -; the decision depends largely on the judgement of the observer. For example, a building is regarded as no longer existing if it is dismantled and the materials reused in a different configuration. On the other hand, human beings go through radical and profound changes during their life-span, affecting both material composition and form, yet preserve their identity by other criteria. Similarly, inanimate objects may be subject to exchange of parts and matter. The class E77 Persistent Item does not take any position about the nature of the applicable identity criteria and if actual knowledge about identity of an instance of this class exists. There may be cases, where the identity of an E77 Persistent Item is not decidable by a certain state of knowledge.  The main classes of objects that fall outside the scope the E77 Persistent Item class are temporal objects such as periods, events and acts, and descriptive properties. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.2 |

## E78 Curated Holding

|  |  |
| --- | --- |
| **Class Label** | **E78 Curated Holding** |
| **Subclass of** | E24 Physical Man Made Thing PE32 Curated Thing |
| **Superclass of** |  |
| **Scope Note** | This class comprises aggregations of instances of E18 Physical Thing that are assembled and maintained (“curated” and “preserved,” in museological terminology) by one or more instances of E39 Actor over time for a specific purpose and audience, and according to a particular collection development plan. Typical instances of curated holdings are museum collections, archives, library holdings and digital libraries. A digital library is regarded as an instance of E18 Physical Thing because it requires keeping physical carriers of the electronic content.  Items may be added or removed from an E78 Curated Holding in pursuit of this plan. This class should not be confused with the E39 Actor maintaining the E78 Curated Holding often referred to with the name of the E78 Curated Holding (e.g. “The Wallace Collection decided…”).  Collective objects in the general sense, like a tomb full of gifts, a folder with stamps or a set of chessmen, should be documented as instances of E19 Physical Object, and not as instances of E78 Curated Holding. This is because they form wholes either because they are physically bound together or because they are kept together for their functionality. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.2 |

### E97 Monetary Amount

|  |  |
| --- | --- |
| **Class Label** | **E97 Monetary Amount** |
| **Subclass of** | E54 Dimension |
| **Superclass of** |  |
| **Scope Note** | This class comprises quantities of monetary possessions or obligations in terms of their nominal value with respect to a particular currency. These quantities may be abstract accounting units, the nominal value of a heap of coins or bank notes at the time of validity of the respective currency, the nominal value of a bill of exchange or other documents expressing monetary claims or obligations. |
| **Examples** | Christies’ hammer price for “Vase with Fifteen Sunflowers” (E97) has currency British Pounds (E98) |
| **External Ontology Origin** | CIDOC CRM 6.2.2 |

# 

# Referred Relations

## P1 is identified by (identifies)

|  |  |
| --- | --- |
| **Relation Label** | **P1 is identified by (identifies)** |
| **Subrelation of** | - |
| **Superrelation of** | PP28 has designated access point (is designated access point of) |
| **Domain** | E1 CRM Entity |
| **Range** | E41 Appellation |
| **Scope** | This property describes the naming or identification of any real world item by a name or any other identifier.  This property is intended for identifiers in general use, which form part of the world the model intends to describe, and not merely for internal database identifiers which are specific to a technical system, unless these latter also have a more general use outside the technical context. This property includes in particular identification by mathematical expressions such as coordinate systems used for the identification of instances of E53 Place. The property does not reveal anything about when, where and by whom this identifier was used. A more detailed representation can be made using the fully developed (i.e. indirect) path through E15 Identifier Assignment. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

## 

## P2 has type (is type of)

|  |  |
| --- | --- |
| **Relation Label** | **P2 has type (is type of)** |
| **Subrelation of** | - |
| **Superrelation of** | PP51 has availability (is availability of)  PP58 is encoded with (is encoding of) |
| **Domain** | E1 CRM Entity |
| **Range** | E55 Type |
| **Scope** | This property allows sub typing of CRM entities - a form of specialisation – through the use of a terminological hierarchy, or thesaurus.  The CRM is intended to focus on the high-level entities and relationships needed to describe data structures. Consequently, it does not specialise entities any further than is required for this immediate purpose. However, entities in the isA hierarchy of the CRM may by specialised into any number of sub entities, which can be defined in the E55 Type hierarchy. E51 Contact Point, for example, may be specialised into “e-mail address”, “telephone number”, “post office box”, “URL” etc. none of which figures explicitly in the CRM hierarchy. Sub typing obviously requires consistency between the meaning of the terms assigned and the more general intent of the CRM entity in question. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

## P9 consists of (forms part of)

|  |  |
| --- | --- |
| **Relation Label** | **P9 consists of (forms part of)** |
| **Subrelation of** | - |
| **Superrelation of** | PP1 currently offers (currently offered by)  PP43 supports project activity (is project activity supported by) |
| **Domain** | E4 Period |
| **Range** | E4 Period |
| **Scope** | This property associates an instance of E4 Period with another instance of E4 Period that is defined by a subset of the phenomena that define the former. Therefore the space time volume of the latter must fall within the space time volume of the former.  This property is transitive. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

## P14 carried out by (performed)

|  |  |
| --- | --- |
| **Relation Label** | **P14 carried out by (performed)** |
| **Subrelation of** | - |
| **Superrelation of** | PP2 provided by (provides) PP3 requested by (requests) PP53 had awarder (was awarded by) PP54 had awardee (was awarded to) |
| **Domain** | E7 Activity |
| **Range** | E39 Actor |
| **Scope** | This property describes the active participation of an E39 Actor in an E7 Activity.  It implies causal or legal responsibility. The P14.1 in the role of property of the property allows the nature of an Actor’s participation to be specified. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

## 

## P15 was influenced by (influenced)

|  |  |
| --- | --- |
| **Relation Label** | **P15 was influenced by (influenced)** |
| **Subrelation of** | - |
| **Superrelation of** | PP25 has maintaining RI (is maintaining RI of) |
| **Domain** | E7 Activity |
| **Range** | E1 CRM Activity |
| **Scope** | This is a high level property, which captures the relationship between an E7 Activity and anything that may have had some bearing upon it.  The property has more specific sub properties. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

## P16 used specific object (was used for)

|  |  |
| --- | --- |
| **Relation Label** | **P16 used specific object (was used for)** |
| **Subrelation of** | - |
| **Superrelation of** | PP4 hosts object (is object hosted by) PP14 runs on request (is run by) PP15 delivers on request (is delivered by) PP29 uses access protocol (is access protocol used by) PP48 uses protocol parameter (is protocol parameter of) P55 awarded (was thing awarded by) |
| **Domain** | E7 Activity |
| **Range** | E70 Thing |
| **Scope** | This property describes the use of material or immaterial things in a way essential to the performance or the outcome of an E7 Activity.  This property typically applies to tools, instruments, moulds, raw materials and items embedded in a product. It implies that the presence of the object in question was a necessary condition for the action.  For example, the activity of writing this text required the use of a computer. An immaterial thing can be used if at least one of its carriers is present. For example, the software tools on a computer.  Another example is the use of a particular name by a particular group of people over some span to identify a thing, such as a settlement. In this case, the physical carriers of this name are at least the people understanding its use. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

### 

### P17 was motivated by (motivated)

|  |  |
| --- | --- |
| **Relation Label** | **P17 was motivated by (motivated)** |
| **Subrelation of** | - |
| **Superrelation of** | PP44 has maintaining team  PP56 awarded for (was award of) |
| **Domain** | E7 Activity |
| **Range** | E1 CRM Entity |
| **Scope** | This property describes an item or items that are regarded as a reason for carrying out the E7 Activity.  For example, the discovery of a large hoard of treasure may call for a celebration, an order from headquarters can start a military manoeuvre. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

### P21 had general purpose (was purpose of)

|  |  |
| --- | --- |
| **Relation Label** | **P21 had general purpose (was purpose of))** |
| **Subrelation of** | - |
| **Superrelation of** | PP45 has competency |
| **Domain** | E7 Activity |
| **Range** | E55 Type |
| **Scope** | This property describes an intentional relationship between an E7  Activity and some general goal or purpose.  This may involve activities intended as preparation for some type of activity or event. *P21had general purpose (was purpose of)* differs from *P20 had specific purpose (was purpose of)* in that no occurrence of an event is implied as the purpose. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

## P33 used specific technique (was used by)

|  |  |
| --- | --- |
| **Relation Label** | **P33 used specific technique (was used by)** |
| **Subrelation of** | - |
| **Superrelation of** | PP31 uses curation plan (is curation plan used by) |
| **Domain** | E7 Activity |
| **Range** | E29 Design or Procedure |
| **Scope** | This property identifies a specific instance of E29 Design or Procedure in order to carry out an instance of E7 Activity or parts of it.  The property differs from P32 used general technique (was technique of) in that P33 refers to an instance of E29 Design or Procedure, which is a concrete information object in its own right rather than simply being a term or a method known by tradition.  Typical examples would include intervention plans for conservation or the construction plans of a building. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

## 

## P106 is composed of (forms part of)

|  |  |
| --- | --- |
| **Relation Label** | **P106 is composed of (forms part of)** |
| **Subrelation of** | - |
| **Superrelation of** | PP16 has persistent digital object part (is persistent digital object part of) PP18 has digital object part (is digital object part of) |
| **Domain** | E90 Symbolic Object |
| **Range** | E90 Symbolic Object |
| **Scope** | This property associates an instance of E90 Symbolic Object with a part of it that is by itself an instance of E90 Symbolic Object, such as fragments of texts or clippings from an image.  This property is transitive |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

## 

## P125 used object of type (was type of object used in)

|  |  |
| --- | --- |
| **Relation Label** | **P125 used object of type (was type of object used in)** |
| **Subrelation of** |  |
| **Superrelation of** | PP47 has protocol type (is protocol type of) |
| **Domain** | E7 Activity |
| **Range** | E55 Type |
| **Scope** | This property defines the kind of objects used in an E7 Activity, when the specific instance is either unknown or not of interest, such as use of "a hammer. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

## P129 is about (is subject of)

|  |  |
| --- | --- |
| **Relation Label** | **P129 is about (is subject of)** |
| **Subrelation of** | - |
| **Superrelation of** | PP39 is metadata for (has metadata) |
| **Domain** | E89 Propositional Object |
| **Range** | E1 CRM Entity |
| **Scope** | This property documents that an E89 Propositional Object has as subject an instance of E1 CRM Entity.  This differs from P67 refers to (is referred to by), which refers to an E1 CRM Entity, in that it describes the primary subject or subjects of an E89 Propositional Object. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

## P130 shows features of (features are also found on)

|  |  |
| --- | --- |
| **Relation Label** | **P130 shows features of (features are also found on)** |
| **Subrelation of** | - |
| **Superrelation of** | PP17 has snapshot (is snapshot of) |
| **Domain** | E70 Thing |
| **Range** | E70 Thing |
| **Scope** | This property generalises the notions of "copy of" and "similar to" into a directed relationship, where the domain expresses the derivative, if such a direction can be established.  Otherwise, the relationship is symmetric. If the reason for similarity is a sort of derivation process, i.e., that the creator has used or had in mind the form of a particular thing during the creation or production, this process should be explicitly modelled. Moreover it expresses similarity in cases that can be stated between two objects only, without historical knowledge about its reasons. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.1 |

## P147 curated (was curated by)

|  |  |
| --- | --- |
| **Relation Label** | **P147 curated (was curated by)** |
| **Subrelation of** | PP32 curates (is curated by) |
| **Superrelation of** | - |
| **Domain** | E87 Curation Activity |
| **Range** | E78 Curated Holding |
| **Scope** | This property associates an instance of E87 Curation Activity with the instance of E78 Collection or collections with that is subject of that curation activity following some implicit or explicit curation plan. |
| **Examples** |  |
| **External Ontology Origin** | CIDOC CRM 6.2.3 |