FRBR

object-oriented definition and mapping to $FRBR_{ER}$ (version 0.8.3 draft)

International Working Group on FRBR and CIDOC CRM Harmonisation

supported by Delos NoE

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August 2007

Introduction

This document is the draft definition of **FRBR[1] (object-oriented version, harmonised with CIDOC CRM**), hereafter referred to as **$FRBR_{OO}$**, a formal ontology intended to capture and represent the underlying semantics of bibliographic information and to facilitate the integration, mediation, and interchange of bibliographic and museum information.

The FRBR model was originally designed as an entity-relationship model by a study group appointed by the International Federation of Library Associations and Institutions (IFLA) during the period 1991-1997, and was published in 1998.

Quite independently, the CIDOC CRM[2] model was being developed from 1996 under the auspices of the ICOM-CIDOC (International Council for Museums – International Committee on Documentation) Documentation Standards Working Group.

The idea that both the library and museum communities might benefit from harmonising the two models was first expressed in 2000, on the occasion of ELAG's (European Library Automation Group) 24th Library Systems Seminar in Paris, with Nicholas Crofts and Dan Matei drafting on the spot a preliminary object-oriented representation of the FRBR model entities roughly mapped to CIDOC CRM classes. This idea grew up in the following years and eventually led to the formation in 2003 of the International Working Group on FRBR/CIDOC CRM Harmonisation, that brings together representatives from both communities with the common goals of: a) Expressing the IFLA FRBR model with the concepts, tools, mechanisms, and notation conventions provided by the CIDOC CRM, and: b) Aligning (possibly even merging) the two object-oriented models thus obtained.

The International Working Group on FRBR/CIDOC CRM Harmonisation, chaired by Martin Doerr (ICS FORTH, Greece) and Patrick Le Bœuf (BnF, France), is affiliated at the same time to the IFLA FRBR Review Group and the CIDOC CRM Special Interest Group (CRM-SIG). Its past [and scheduled] meetings, on the occasion of which the current definition of $FRBR_{OO}$ was developed, include:

- Meeting #1: 2003, Nov. 12-14, Paris;
- Meeting #2: 2004, March 22-25, Heraklion, Greece;
- Meeting #3: 2005, February 14-16, London;
- Meeting #4: 2005, July 4-6, Heraklion, Greece;
- Meeting #5: 2005, November 16-18, Nuremberg, Germany;
- Meeting #6: 2006, March 27-29, London;
- Meeting #7: 2006, June 26-29, Trondheim, Norway;
- Meeting #8: 2006, October 25-27, Heraklion, Greece;
- Meeting #9: 2007, March 14-16, Paris;
- Meeting #10: 2007, July 9-10, Edinburgh, Scotland.

[1] "FRBR" is supposed to stand for: "Functional Requirements for Bibliographic Records," after the name of the Study Group that developed the model. However, current use and understanding of the FRBR model go well beyond that, and the term "FRBR" has now turned to a noun in its own right, used without particular intention to refer to "functionalities," nor to "requirements," but rather to the *semantics* of bibliographic records. The *Final Report on Functional Requirements for Bibliographic Records* published in 1998 contained both a study on functional requirements for bibliographic records, and a description of the model known today as "FRBR."

[2] "CIDOC CRM" is supposed to stand for "Comité international de documentation [= International Committee on Documentation] Conceptual Reference Model," which, when isolated from any context, is not particularly meaningful (CIDOC is affiliated to ICOM, the International Council of Museums). Just like FRBR, the acronym, rather meaningless by itself, has now turned to a noun in its own right.

Part of this work supported by DELOS NoE.

1. Purposes

This model attempts to represent FRBR by modelling in a sufficiently consistent way the conceptualisation of the reality behind library practice, as it is apparent from or implicit in FRBR. It is important to keep in mind that the aim is not to "transform" the IFLA FRBR model into something totally different or "better," nor of course to "reject" it or "replace" it – but to *express* the conceptualisation of FRBR with the object-oriented methodology instead of the entity-relationship methodology, as an alternative. Nor is it the intention to force museums' concerns and viewpoints into the bibliographic universe, or libraries' concerns and viewpoints into the museum universe. Rather, the point is to identify the common grounds of the universe both sides share and to ensure mutual benefit by pursuing the following objectives.

1.1. A common view of cultural heritage information

The main goal is to reach a common view of cultural heritage information with respect to modelling, standards, recommendations, and practices. Libraries and museums are "memory institutions" – both strive to preserve cultural heritage objects, and information about such objects, and they often share the same users. Besides, the boundary between them is often blurred: libraries hold a number of "museum objects" and museums hold a number of "library objects;" the cultural heritage objects preserved in both types of institutions were created in the same cultural *context* or *period,* sometimes by the same *agents,* and they provide evidence of comparable *cultural features.* It seems therefore appropriate to build a common conceptualisation of the information gathered by the two types of organisations about cultural heritage.

1.2. A verification of FRBR's internal consistency

Expressing the FRBR model in a different formalism than the one in which it was originally developed is also a good opportunity to correct some semantic inconsistencies or inaccuracies in the formulation of FRBR, that may be regarded as negligible as far as $FRBR_{ER}$ is only used in a library catalogue context, but that prove to be quite crucial from the moment one strives to design an overall model for the integration of cultural heritage related information.

1.3. An enablement of information interoperability and integration

Mediation tools and Semantic Web activities require an integrated, shared ontology for the information accumulated by both libraries and museums for all the collections that they hold, seen as a continuum from highly "standardised" products such as books, CDs, DVDs,

etc., to "raw" materials such as plants or stones[3], through "in-between" objects such as draft manuscripts or engraving plates. Besides, such typical "library objects" as books can be about museum objects, and museum objects can represent events or characters found in books (e.g., "Ophelia's death"): such interrelationships should be either integrated in common information storage, or at least virtually integrated through mediation devices that allow a query to be simultaneously launched on distinct information depositories, which requires common semantic tools such as $FRBR_{OO}$ plugged into CIDOC CRM.

1.4. An opportunity for mutual enrichment for FRBR and CIDOC CRM

The CIDOC CRM model is influenced by the process of FRBR's re-formulation as well. Modelling bibliographic information highlights some issues that may have been overlooked during the development of CIDOC CRM, and the way such issues were addressed in $FRBR_{OO}$ resulted in some cases in making changes in the CIDOC CRM model.

1.5. An extension of the scope of FRBR and the CIDOC CRM

The harmonisation between the two models is also an opportunity to extend the scope of the CIDOC CRM to bibliographic information, which paves the way for extensions to other domains and formats, such as EAD, TEI, MPEG7, just to name a few. Consequently, it also extends the scope of FRBR to cultural materials, since FRBR "inherits" all concepts of the CIDOC CRM, and opens the way for FRBR to benefit from further extensions of the scope of CIDOC CRM, such as the scientific heritage of observations and experiments.

1.6. A first step toward future applications aiming at a global knowledge network

Defining $FRBR_{OO}$ opens the way to future applications, related to Semantic Web activities, that will enable Web services to re-use seamlessly cultural and other information stored in heterogeneous library and museum databases, and create semantic paths between and among them.

2. Method

2.1. Sources

The main source for the task of "OO-ing" FRBR was, quite naturally, the IFLA *Final Report* that contains the complete definition of $FRBR_{ER}$ itself:

> IFLA Study Group on the functional requirements for bibliographic records. *Functional requirements for bibliographic records:* final report [printed text]. Munich, Germany: K. G. Saur, 1998. Also available online from World Wide Web: <http://www.ifla.org/VII/s13/frbr/frbr.pdf>, or: <http://www.ifla.org/VII/s13/frbr/frbr.htm>.

[3] Natural history museums also are witnesses of "cultural features." A frog in a museum is not a testimony of "what a frog is," but of what a human culture, at a given point in time and space, thinks a frog is.

Common awareness of the *Definition of the CIDOC Conceptual Reference Model* provides the required conceptual and technical background:

> ICOM/CIDOC Documentation Standards Group; & CIDOC CRM Special Interest Group. *Definition of the CIDOC Conceptual Reference Model:* version 4.0, April 2004 [electronic resource]. [Heraklion, Greece]: [ICS-FORTH], 2004. Available online at: <http://cidoc.ics.forth.gr/docs/cidoc_crm_version_4.0.doc>, or: <http://cidoc.ics.forth.gr/docs/cidoc_crm_version_4.0.pdf>.

Later on, the concepts declared in the definition of the FRAR model (the model developed by IFLA for authority data) and the definition of the FRSAR model (the future model for subject cataloguing and indexing) will be incorporated in $FRBR_{OO}$.

2.2. Understanding the attributes and relationships

The methodology consisted in a thorough examination of all attributes and relationships declared in $FRBR_{ER}$. During its meetings, the International Working Group on FRBR/CIDOC CRM Harmonisation strove to extract their semantics as accurately as possible, to express them as "properties" in the sense of CIDOC CRM, and to compare them with possibly existing CIDOC CRM properties. Entities, or classes in the terminology adopted by the CIDOC CRM, play a nearly secondary role as the maximal sets of things for which a property is applicable.

2.3. Transforming attributes into properties

The CIDOC CRM model declares no "attributes" at all, but regards any information element as a "property" (or "relationship") between two classes. The semantics extracted from $FRBR_{ER}$ attributes are therefore rendered in $FRBR_{OO}$ as properties, according to the same principles as the CIDOC CRM model.

2.4. By-product 1: Re-contextualising bibliographic entities

The process of interpreting the precise semantic value of each individual attribute declared in $FRBR_{ER}$ and expressing that semantic value in CRM-like structures resulted also in two "by-products."

The first by-product was that it proved necessary to explicate and model the general context within which the bibliographic entities isolated in $FRBR_{ER}$ come into being. $FRBR_{ER}$ envisions bibliographic entities as static, ever-existing things that come from nowhere, and overlooks the complicated path from the initial idea for a new work in a creator's mind to the physical item in a user's hands through the dramatically important decision-making on behalf of publishers. As a matter of fact, bibliographic records *do* contain implicit information about that complicated path and the relationships it implies between and among bibliographic objects; $FRBR_{OO}$ digs that implicit information out of bibliographic structures, e.g. the precise meaning of "date of publication".

2.5. By-product 2: Adding a bibliographic flavour to CIDOC CRM

The second by-product was that the analysis provided for bibliographic processes in

$FRBR_{OO}$ gave way to the introduction of refinements into CIDOC CRM, so that the museum community's model could give a better account for mass production phenomena (such as the printing of engravings, for instance), or the relation between creating immaterial content and physical carrier. Further, it introduces a basic model of intellectual conception and derivation applicable to all art forms, which the museum community has been hesitating so far to formally analyse.

3. Differences between $FRBR_{ER}$ and $FRBR_{OO}$

3.1. Introduction of temporal entities, events and time processes

"Temporal entities" (i.e., phenomena, "perdurants" in philosophy) play a central role in the CIDOC CRM model, as they are the only means to relate objects (either conceptual or physical) to time-spans, locations, and agents. Since $FRBR_{OO}$ borrows structures from the CIDOC CRM to express the concepts declared in $FRBR_{ER}$, "temporal entities" had inevitably to be introduced into $FRBR_{OO}$. Besides, a number of FRBR commentators had already made the point that time issues are insufficiently addressed in $FRBR_{ER}$[4]; the task of harmonising FRBR with the CIDOC CRM was an opportunity to fix that. Temporal entities were introduced into $FRBR_{OO}$ by declaring some of the classes of $FRBR_{OO}$ as subclasses of the following classes from CIDOC CRM: E65 Creation, E12 Production, and E13 Attribute Assignment.

3.2. Refinement of group 1 entities

$FRBR_{ER}$ was flawed with some logical inconsistencies, in particular with regard to its "Group 1 of entities," those entities that account for the content of a catalogue record.

The Work entity such as defined in $FRBR_{ER}$ seemed to cover various realities with distinct properties. While the main interpretation intended by the originators of $FRBR_{ER}$ seems to have been that of a set of concepts regarded as commonly shared by a number of individual sets of signs (or "Expressions"), other interpretations were possible as well: that of the set of concepts expressed in one particular set of signs, independently of the materialisation of that set of signs; and that of the overall abstract content of a given publication. $FRBR_{OO}$ retains the vague notion of "Work" as a superclass for the various

[4] HEANEY, Michael. *Time is of the essence:* some thoughts occasioned by the papers contributed to the International Conference on the Principles and Future Development of AACR [on line]. Oxford: Bodleian Library, 1997 [cited 9 March 2000]. Available from World Wide Web: <http://www.bodley.ox.ac.uk/users/mh/time978a.htm>.
LAGOZE, Carl. Business unusual: how "event-awareness" may breathe life into the catalog?. In: *Conference on bibliographic control in the new millennium* [on line]. Washington: Library of Congress, October 19, 2000 [cited 28 December 2000]. Available from Internet: <http://lcweb.loc.gov/catdir/bibcontrol/lagoze_paper.html>.
FITCH, Kent. *ALEG Data Model. Inventory* [on line]. [Brisbane]: AustLit Gateway, revised 27 July 2000 [cited 26 March 2004]. Available from World Wide Web: <http://www.austlit.edu.au:7777/DataModel/inventory.html>.
DOERR, Martin; HUNTER, Jane; LAGOZE, Carl. Towards a core ontology for information integration. In: *Journal of Digital Information* [on line]. 2003-04-09, Vol. 4, No. 1 [cited 15 May 2003]. Available from World Wide Web: <http://jodi.ecs.soton.ac.uk/Articles/v04/i01/Doerr/>.

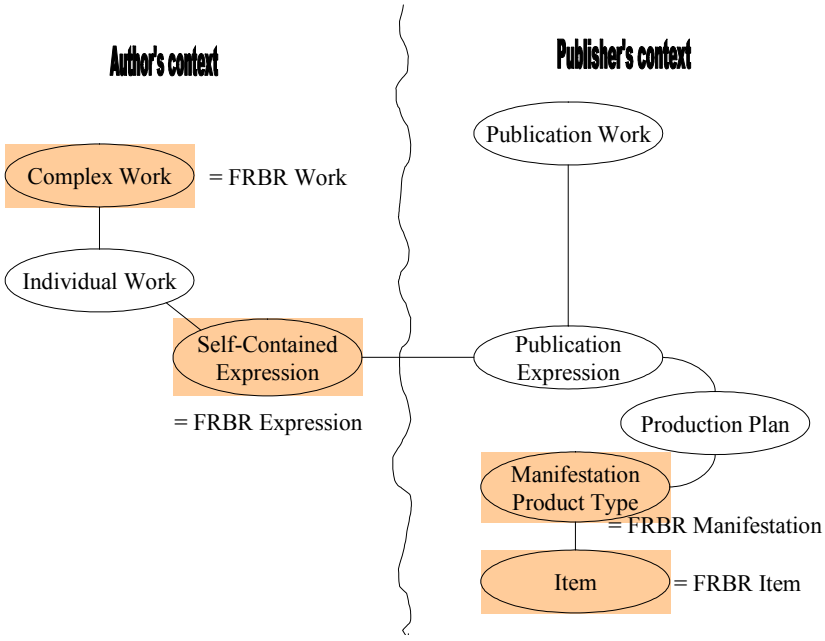
possible ways of interpreting the $FRBR_{ER}$ definitions: F46 Individual Work corresponds to the concepts associated to one complete set of signs (i.e., one individual instance of F20 Self-Contained Expression); F43 Publication Work comprises publishers' intellectual contribution to a given publication; and F21 Complex Work is closer to what seems to have been the main interpretation intended in $FRBR_{ER}$. Additionally, a further subclass is declared for F1 Work: F48 Aggregation Work, which provides a framework for conceptualising works that consist in gathering sets of signs, or fragments of sets of signs, of various origins ("aggregates").

The Expression entity is relatively clear in $FRBR_{ER}$, at least from a purely conceptual point of view. However, the need was felt for a distinction between expressions that convey the complete idea of the work they realise, and expressions that convey only a part of it: that is, between instances of F20 Self-Contained Expression and instances of F23 Expression Fragment.

The Manifestation entity was defined in $FRBR_{ER}$ in such a way that it could be interpreted as something physical and conceptual at the same time: it was defined at the same time as "the *physical embodiment* of an expression of a work" and as an entity that "*represents* all the physical objects that bear the same characteristics," i.e., as both a physical artefact and a (mental) representation of physical artefacts (a set). The original Manifestation was likely to cover either a manuscript (in which case Manifestation overlaps with Item) or a publication (in which case Manifestation is both a Type and an Information Object). $FRBR_{OO}$ strives to solve such logical inconsistencies, and had to "split" the Manifestation entity into two distinct classes, corresponding to the two possible ways of interpreting the ambiguous definition provided for Manifestation in $FRBR_{ER}$, namely F3 Manifestation Product Type and F4 Manifestation Singleton. Whereas F3 Manifestation Product Type is declared as a subclass of the CIDOC CRM class E55 Type, and therefore as a subclass, too, of the CIDOC CRM class E28 Conceptual Object (a merely abstract notion), F4 Manifestation Singleton is declared as a subclass of the CIDOC CRM class E24 Physical Man-Made Thing, and therefore as a subclass, too, of the CIDOC CRM class E18 Physical Thing.

The Item entity did not pose any peculiar problem in $FRBR_{ER}$; but splitting Manifestation into F3 Manifestation Product Type and F4 Manifestation Singleton obliged the Working Group to rethink the articulation between F4 Manifestation Singleton and F5 Item.

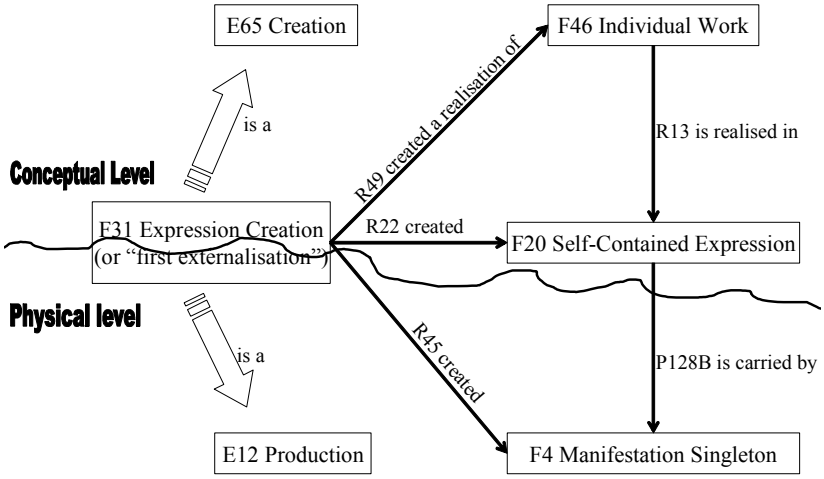
All in all, here is a picture of how original $FRBR_{ER}$ entities relate to the classes declared in $FRBR_{OO}$:



3.3 Analysis of creation and production processes

It proved necessary to analyse creation and production processes, in order to enable a better understanding of interrelations and temporal order.

In particular, the notion of "first externalisation" of a set of signs or expression (and, through the expression, the first externalisation of the individual work realised in the expression) is fully modelled in $FRBR_{OO}$. It is regarded at the same time as a subclass of the creation of something conceptual, and the production of something physical, because the creation of an expression inevitably also affects the physical world, as the recording of the expression causes a physical modification of the object on which it is being recorded. The spatio-temporal circumstances under which the expression is created are necessarily the same spatio-temporal circumstances under which the carrier of the newly created expression is produced. This double phenomenon of conceptual creation/physical production can be represented by the following schema:



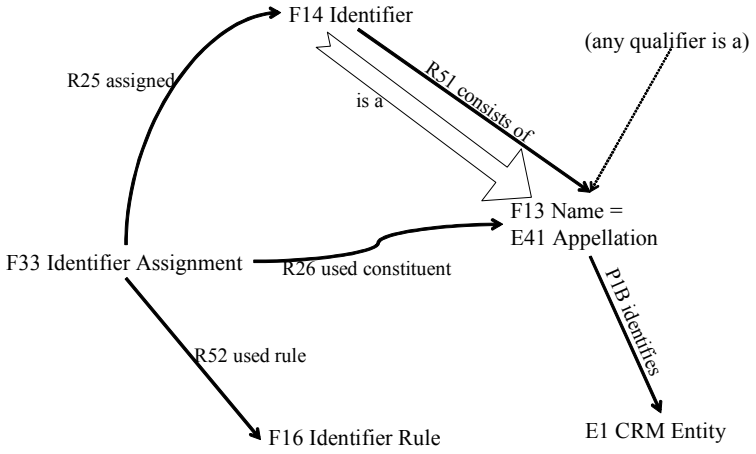
Another topic that is modelled in $FRBR_{OO}$ is the distinction that has to be made between the process of physical publishing and the process of electronic publishing.

3.4. Analysis of procedures of the cataloguing process

Cataloguing is a complex, tricky activity, that involves much knowledge and concatenations of mental processes of which cataloguers themselves are often unaware but which comprise their own expertise. The work that was being done on FRBR was also a good opportunity to explicate some of such mental processes, and to show how cataloguers do what they do.

For instance, one of the most complex processes involved in cataloguing, the creation of controlled access points, consists in selecting and assembling existing *appellations* so as to make the resulting construct as specific, accurate, and "unique" as possible, so as to disambiguate the way a given instance of a given bibliographic entity is consistently referred to in a given bibliographic database. In order to model that complex process, the Working Group declared two distinct classes (one of which was borrowed from the CIDOC CRM): F13 Name (= CIDOC CRM E41 Appellation), and F14 Identifier. F14 Identifier corresponds to standardised strings such as uniform titles, as well as the notion of numeric identifiers such as international standard numbers defined in ISO standards (such as ISBN, ISSN, ISRC etc.), and is declared as a subclass of F13 Name, which makes it possible to assemble two constructed identifiers in order to create a new, distinct identifier (as is the case, for instance, when one creates an author-title heading in order to refer to a work through the controlled form of its creator's name, the dates that identify the time-span during which the creator was alive or active, and a selected form of the work's title). Any "qualifier" used in cataloguing practice to disambiguate headings is regarded as the name (or appellation) of something, thanks to the mechanisms defined in CIDOC CRM: "dates" are the appellation of a given time-span (E52 in CIDOC CRM), the "title of a person" is the appellation of a type (E55 in CIDOC CRM), a qualifier such as "(Coventry)" as the example is provided in the *FRBR Final*

Report is the name of a place (E53 in CIDOC CRM), a qualifier such as "(Motion picture)" as required in AACR in uniform titles for cinematic works is the appellation of a type (E55) of work, etc. This activity can be represented as:



4. Next steps

Future tasks will involve the examination of all other $FRBR_{ER}$ entities (Person, Group, Concept, Place, Event, and Object), of all $FRAR_{ER}$ entities that are not mentioned in $FRBR_{ER}$, and of all relationships described in both $FRBR_{ER}$ and $FRAR_{ER}$. The resulting picture will be formalised and stabilised, and will result in a full-length description of $FRBR_{OO}$, which will be submitted for approval to both the CIDOC CRM SIG and the IFLA FRBR Review Group (and the IFLA Cataloguing Section of which it is an emanation). It is expected that $FRBR_{OO}$ will be regarded as a new, "official" release of the IFLA FRBR model. However, the highly pedagogical value of $FRBR_{ER}$ is recognised, and it is also expected that $FRBR_{ER}$ will be retained by IFLA (although presumably with a number of modifications, e.g. some attributes will have to be removed from one entity to another) for pedagogical purposes and to provide "lay" people with a convenient overview of the model, whereas $FRBR_{OO}$ will be used for implementation purposes, most notably in the context of integrated information system design and Semantic Web activities, for which it is more appropriate than $FRBR_{ER}$.

5. Naming conventions

All the classes declared were given both a name and an identifier constructed according to the conventions used in the CIDOC CRM model. That identifier consists of the letter F followed by a number for classes. Resulting properties were also given a name and an

identifier, constructed according to the same conventions. That identifier consists of the letter R followed by a number, which in turn is followed by the letter "B" every time the property is mentioned "backwards", i.e., from target to domain. "F" and "R" are to be understood as the first two letters of "FRBR" and do not have any other meaning. They correspond respectively to letters "E" and "P" in CIDOC CRM naming conventions, where "E" originally meant "entity" (although the CIDOC CRM "entities" are now consistently called "classes") and "P" means "property". Whenever CIDOC CRM classes are used in $FRBR_{OO}$, they are named by the name they have in the original CIDOC CRM. A number of properties are identified by the letters "CLP" and a number; "CLP" stands for "CLass Property" and such properties are taken from Meta-CRM; all of them have F3 Manifestation Product Type as domain, and they indicate that all the exemplars of a given publication "are supposed to" or "should" display the features of the publication they belong to. The publication itself, being an abstract notion, cannot have physical qualities such as, for instance, a given number of pages, but meta-properties are a mechanism borrowed from CIDOC CRM and Meta-CRM that makes it possible to express that a publication is characterised by the number of pages that all of its exemplars, under "ideal" conditions, "should have."

All classes and properties that were borrowed directly from the CIDOC CRM are named as in CIDOC CRM, i.e., with an identifier beginning with either "E" if it is a class, or "P" if it is a property, and with the original appellation for the class or property in CIDOC CRM.

The choice of the domain of properties, and hence the order of their names, are established in accordance with the following priority list:

- Temporal Entity and its subclasses
- Thing and its subclasses
- Actor and its subclasses
- Other

6. Class & Property Hierarchies

Although they do not provide comprehensive definitions, compact monohierarchical presentations of the class and property IsA hierarchies have been found to significantly aid comprehension and navigation of the FRBRoo, and are therefore provided below.

The class hierarchy presented below has the following format:

- Each line begins with a unique class identifier, consisting of a number preceded by the letter "F" (originally denoting "entity," although now replaced by convention with the term "class").
- A series of hyphens ("-") follows the unique class identifier, indicating the hierarchical position of the class in the IsA hierarchy.
- The English name of the class appears to the right of the hyphens.
- The index is ordered by hierarchical level, in a "depth first" manner, from the smaller to the larger subhierarchies.
- Classes that appear in more than one position in the class hierarchy as a result of multiple inheritance are shown in an italic typeface.

The property hierarchy presented below has the following format:

- Each line begins with a unique property identifier, consisting of a number preceded by the letter "R" (for "property").
- A series of hyphens ("-") follows the unique property identifier, indicating the

hierarchical position of the property in the IsA hierarchy.

- The English name of the property appears to the right of the hyphens, followed by its inverse name in parentheses for reading in the range to domain direction.
- The domain class for which the property is declared.
- The range class that the property references.
- The index is ordered by hierarchical level, in a “depth first” manner, from the smaller to the larger subhierarchies, and by property number between equal siblings.
- Properties that appear in more than one position in the property hierarchy as a result of multiple inheritance are shown in an italic typeface.

FRBR Class Hierarchy

F1 Work
F46 - Individual Work
F48 - - Aggregation Work
F21 - Complex Work
F22 - - Serial Work
F54 - Container Work
F48 - - *Aggregation Work*
F43 - - Publication Work
F22 - - - *Serial Work*
F51 - - Performance Work
F53 - Recording Work
F2 Expression
F20 - Self-Contained Expression
F41 - - Publication Expression
F50 - - Performance Plan
F23 - Expression Fragment
F56 - Recording
F3 Manifestation Product Type
F4 Manifestation Singleton
F5 Item
F7 Corporate Body
F28 - Bibliographic Agency
F8 Person
F9 Concept
F10 Object
F11 Event
F12 Place
F13 Name
F14 - Identifier
F16 Identifier Rule
F30 Work Conception
F31 Expression Creation
F55 - Recording Event
F33 Identifier Assignment
F36 Representative Manifestation Assignment
F37 Representative Expression Assignment
F39 Production Plan
F40 Carrier Production Event
F44 Reproduction Event
F45 Publication Event
F52 Performance

FRBR Class Hierarchy aligned with (part of) CIDOC CRM Class Hierarchy

E1 CRM Entity
E2 - Temporal Entity
E4 - - Period = F11 Event
E5 - - - Event
E7 - - - - Activity
F52 - - - - - Performance
E11 - - - - - Modification
E12 - - - - - - Production
F31 - - - - - - - Expression Creation
F40 - - - - - - - Carrier Production Event
F44 - - - - - - - Reproduction Event
E13 - - - - - -Attribute Assignment
F33 - - - - - - -Identifier Assignment
E15 - - - - - - - -Identifier Assignment
F36 - - - - - - -Representative Manifestation Assignment
F37 - - - - - - -Representative Expression Assignment
E65 - - - - - -Creation
F30 - - - - - - -Work Conception
F31 - - - - - - *-Expression Creation*
F55 - - - - - - - -Recording Event
F45 - - - - - - -Publication Event
E77 - Persistent Item
E70 - - Thing
E72 - - - Legal Object
F3 - - - - Manifestation Product Type
E18 - - - - Physical Thing = F10 Object
E19 - - - - - Physical Object
E20 - - - - - - Biological Object
E21 - - - - - - - Person = F8 Person
E22 - - - - - - Man-Made Object
E84 - - - - - - - Information Carrier
F5 - - - - - - - - Item
E24 - - - - - Physical Man-Made Thing
F4 - - - - - - Manifestation Singleton
E22 - - - - - - *Man-Made Object*
E84 - - - - - - - *Information Carrier*
F5 - - - - - - - - *Item*
E73 - - - - Information Object
F2 - - - - - Expression
F20 - - - - - - Self-Contained Expression
F41 - - - - - - - Publication Expression
F50 - - - - - - - Performance Plan
F23 - - - - - - Expression Fragment
F56 - - - - - - Recording
E29 - - - - - Design or Procedure
F39 - - - - - - Production Plan
F50 - - - - - - *Performance Plan*
F16 *Identifier Rule*
E71 - - - Man-Made Thing
E24 - - - - *Physical Man-Made Thing*
F4 - - - - - *Manifestation Singleton*
E22 - - - - - *Man-Made Object*
E84 - - - - - - *Information Carrier*
F5 - - - - - - - *Item*

E28 - - - - Conceptual Object = F9 Concept
F1 - - - - - Work
F46 - - - - - - Individual Work
F48 - - - - - - - Aggregation Work
F21 - - - - - - Complex Work
F22 - - - - - - - Serial Work
F54 - - - - - - Container Work
F48 - - - - - - - *Aggregation Work*
F43 - - - - - - - Publication Work
F22 - - - - - - - - *Serial Work*
F51 - - - - - - - Performance Work
F53 - - - - - - Recording Work
E73 - - - - - *Information Object*
F2 - - - - - - *Expression*
F20 - - - - - - - *Self-Contained Expression*
F41 - - - - - - - - *Publication Expression*
F50 - - - - - - - - *Performance Plan*
F23 - - - - - - - *Expression Fragment*
F56 - - - - - - - *Recording*
E29 - - - - - - *Design or Procedure*
F39 - - - - - - - *Production Plan*
F50 - - - - - - - *Performance Plan*
F16 *Identifier Rule*
E55 - - - - - Type
F3 - - - - - - *Manifestation Product Type*
E39 - - Actor
E74 - - - Group = F7 Corporate Body
F28 - - - - Bibliographic Agency
E21 - - - *Person = F8 Person*
E41 - - Appellation = F13 Name
F14 - - - Identifier
E42 - - - - Object Identifier
E53 - Place = F12 Place

FRBR Property Hierarchy:

Property id	Property Name	Entity – Domain	Entity – Range
R1	has constraining supertype (is constraining supertype of)	F1 Work	E55 Type
R65	is realised in (realises)	F1 Work	F20 Self-Contained Expression
- R2	has representative expression (is representative expression for)	F1 Work	F20 Self-Contained Expression
- R13	is realised in (realises)	F21 Complex Work	F20 Self-Contained Expression
-R69	is realised in (realises)	F51 Performance Work	F50 Performance Plan
-R70	is realised in (realises)	F53 Recording Work	F56 Recording
R3	has representative manifestation product type (is representative manifestation product type for)	F2 Expression	F3 Manifestation Product Type
- R9	comprises carriers of (carriers provided by)	F2 Expression	F3 Manifestation Product Type
R5	carries (is carried by)	F5 Item	F41 Publication Expression
R7	is representative manifestation singleton for (has representative manifestation singleton)	F4 Manifestation Singleton	F2 Expression
R10	is example of (has example)	F5 Item	F3 Manifestation Product Type
R11	is composed of (forms part of)	F2 Expression	F20 Self-Contained Expression
R12	has member (is member of)	F21 Complex Work	F1 Work
R15	is fragment of (has fragment)	F23 Expression Fragment	F2 Expression
R16	carried out by (performed)	F36 Representative Manifestation Assignment	F28 Bibliographic Agency
R17	carried out by (performed)	F37 Representative Expression Assignment	F28 Bibliographic Agency
R21	initiated (was initiated by)	F30 Work Conception	F1 Work
R22	created (was created by)	F31 Expression Creation	F2 Expression
R24	assigned to (was assigned by)	F33 Identifier Assignment	E1 CRM Entity
R25	assigned (was assigned by)	F33 Identifier Assignment	F14 Identifier
R26	used constituent (was used in)	F33 Identifier Assignment	F13 Name
R31	assigned to (was assigned by)	F36 Representative Manifestation Assignment	F2 Expression
R32	assigned (was assigned by)	F36 Representative Manifestation Assignment	F3 Manifestation Product Type
R33	assigned to (was assigned by)	F37 Representative Expression Assignment	F21 Complex Work
R34	assigned (was assigned by)	F37 Representative Expression Assignment	F2 Expression
R37	shows how to realise (was realised by)	F39 Production Plan	F3 Manifestation Product Type
R38	produced things of type (was produced by)	F40 Carrier Production Event	F3 Manifestation Product Type
R39	followed (was followed by)	F40 Carrier Production Event	F39 Production Plan
R40	used as source material (was used by)	F40 Carrier Production Event	F41 Publication Expression
R41	produced (was produced by)	F40 Carrier Production Event	F5 Item
R45	created (was created by)	F31 Expression Creation	F4 Manifestation Singleton
R49	created a realisation of (was realised through)	F31 Expression Creation	F46 Individual Work
R51	consists of (forms part of)	F14 Identifier	F13 Name
R52	used rule (was the rule used in)	F33 Identifier Assignment	F16 Identifier Rule
R53	assigned (was assigned by)	F36 Representative Manifestation Assignment	F4 Manifestation Singleton
R55	created production plan (was created by)	F45 Publication Event	F39 Production Plan
R56	is realised in (realises)	F46 Individual Work	F20 Self-Contained Expression
R57	is logical successor of (has successor)	F1 Work	F1 Work
R58	is derivative of (has derivative)	F1 Work	F1 Work
R59	reproduced (was reproduced by)	F44 Reproduction Event	E84 Information Carrier
R60	produced (was produced by)	F44 Reproduction Event	E84 Information Carrier
R61	is reproduction of (has reproduction)	E84 Information Carrier	E84 Information Carrier
R62	has issuing rule (is issuing rule of)	F22 Serial Work	E29 Design or Procedure
R63	incorporates (is incorporated in)	F20 Self-Contained Expression	F2 Expression
R64	performed (was performed in)	F52 Performance	F50 Performance Plan
R66	recorded (was recorded through)	F55 Recording Event	E7 Activity
R67	created (was created through)	F55 Recording Event	F56 Recording

Property id	Property Name	Entity – Domain	Entity – Range
R68	realised (was realised through)	F55 Recording Event	F53 Recording Work
CLP2	should have type (should be type of)	F3 Manifestation Product Type	E55 Type
CLP43	should have dimension (should be dimension of)	F3 Manifestation Product Type	E54 Dimension
CLP45	should consist of (should be incorporated in)	F3 Manifestation Product Type	E57 Material
CLP46	should be composed of (may form part of)	F3 Manifestation Product Type	F3 Manifestation Product Type
CLP57	should have number of parts (should be number of parts of)	F3 Manifestation Product Type	E60 Number
CLP104	subject to (applies to)	F3 Manifestation Product Type	E30 Right
CLP105	right held by (right on)	F3 Manifestation Product Type	E39 Actor
CLR5	should carry (should be carried by)	F3 Manifestation Product Type	F41 Publication Expression

FRBR Class Declaration

F1 Work

Subclass of: E28 Conceptual Object
Superclass of: F46 Individual Work
F21 Complex Work
F53 Recording Work
F54 Container Work

Scope note: This class comprises the sum of concepts which appear in the course of the coherent evolution of an original idea into one or more expressions that are dominated by the original idea. The substance of Work is concepts. A Work may be elaborated by one or more Actors simultaneously or over time. A Work may have members that constitute components of the overall concept or that are alternatives to other members of the work. Members of a work may or may not represent the concept of the Work as a whole; for instance a translation reinterprets the whole, a volume of a trilogy represents a part of the concept.

A Work can be either *individual* or *complex*. If it is individual its concept is completely realised in a single F20 Self-Contained Expression. If it is complex its concept is embedded in an F21 Complex Work. An F21 Complex Work consists of members that are either F21 Complex Works themselves or F46 Individual Works. The member relationship of Work is based on the members respecting the same concept, and should not be confused with the structural parts of an expression, that might be taken from other work.

A Work is the product of an intellectual process of one or more persons, yet only indirect evidence about it is at our hands. This can be contextual information such as the existence of an order for a work, reflections of the creators themselves that are documented somewhere, and finally the expressions of the work created. As ideas normally take shape during discussion, elaboration and implementation, it is not reasonable to assume that a work starts with a complete concept. Moreover, it can be very difficult or impossible to define the whole of the concept of a work at some given time. The only objective evidence for such a notion can be based on a stage of expressions at a given time. In this sense, self-contained expressions serve as a kind of "snap-shots" of a work.

A Work may aggregate expressions of other works into a new expression. E.g. an anthology of poems is regarded as a work in its own right that makes use of expressions of the individual poems that have been selected and ordered as part of an intellectual process. This does not make the contents of the aggregated expressions part of this work, but only parts of the resulting expression.

Examples: Abstract content of Giovanni Battista Piranesi's "Carcere XVI: the pier with chains: 1st state" (F46)

"La Porte de l'Enfer" by Auguste Rodin conceived between 1880-1917 (F21)

"Hamlet" by William Shakespeare (F21)

Properties**:**

R1 has constraining supertype (is constraining supertype of): E55 Type
R2 has representative expression (is representative expression for): F20 Self-contained Expression
R57 is logical successor of (has successor): F1 Work
R58 is derivative of (has derivative): F1 Work
R65 is realised in (realises): F20 Self-contained Expression

F2 Expression

Subclass of: E73 Information Object
Superclass of: F20 Self-Contained Expression
F23 Expression Fragment
F56 Recording

Scope note: This class comprises the intellectual or artistic realisations of *works* in the form of identifiable immaterial items, such as texts, poems, jokes, musical, or choreographic notations, movement pattern, sound pattern, images, multimedia objects, or any combination of such forms that have objectively recognisable structures. The substance of Expression is signs.

Expressions cannot exist without a physical carrier, but do not depend on a specific physical carrier and can exist on one or more carriers simultaneously. Carriers may include human memory.

Inasmuch as the form of *expression* is an inherent characteristic of the *expression*, any change in form (e.g., from alpha-numeric notation to spoken word, a poem created in capitals and rendered in lower case) is a new *expression*. Similarly, changes in the intellectual conventions or instruments that are employed to express a *work* (e.g., translation from one language to another) result in the creation of a new *expression*. Thus, if a text is revised or modified, the resulting *expression* is considered to be a new *expression*. Minor changes, such as corrections of spelling and punctuation, etc., are normally considered variations within the same *expression*. On a practical level, the degree to which distinctions are made between variant *expressions* of a *work* will depend to some extent on the nature of the *work* itself, and on the anticipated needs of users.

The genre of the work may provide an indication of which features are essential to the expression. In some cases, aspects of physical form, such as typeface and page layout, are not integral to the intellectual or artistic realisation of the *work* as such, and therefore are not distinctive criteria for the respective expressions. For another work features such as layout may be essential. For instance, the author or a graphic designer may wrap a poem around an image.

An expression of a work may include expressions of other works within it. E.g. an anthology of poems is regarded as a work in its own right that makes use of expressions of the individual poems that have been selected and ordered as part of an intellectual process. This does not make the contents of the aggregated expressions part of this work, but only parts of the resulting expression.

If an instance of F2 Expression is of a specific form, such as text, image, etc. it may be simultaneously instantiated in the classes representing these forms. Thereby one can make use of the more specific properties of these classes, such as language (which is applicable to linguistic objects only).

Examples: The Italian text of Dante's "Divina Commedia" as found in the authoritative critical edition *La Commedia secondo l'antica vulgata a cura di Giorgio Petrocchi*, Milano: Mondadori, 1966-67 (= Le Opere di Dante Alighieri, Edizione Nazionale a cura della Società Dantesca Italiana, VII, 1-4) (F20)

The Italian text of Dante's "Inferno" as found in the same edition (F20)

"Nel mezzo del cammin di nostra vita
mi ritrovai per una selva oscura
ché la diritta via era smarrita" [the Italian text of the first stanza of Dante's "Inferno" and "Divina Commedia"] (F23)

Christian Morgenstern's "Fisches Nachtgesang" [a poem consisting simply of "-" and "˜" signs, arranged in a determined combination] (F20)

Properties**:**

R3 has representative manifestation product type (is representative manifestation product type for): F3 Manifestation Product Type
R9 carriers provided by (comprises carriers of): F3 Manifestation Product Type
R11 is composed of (forms part of): F20 Self-Contained Expression

F3 Manifestation Product Type

Subclass of: E55 Type
E72 Legal Object

Scope note: This class comprises the definitions of publication products.

An instance of F3 Manifestation Product Type is the "species", and all copies of a given publication are "specimens" of it. An instance of F3 Manifestation Product Type defines all of the features or traits that instances of F5 Item normally display in order that they may be recognised as copies of a particular publication. However, due to production problems or subsequent events one or more instances of F5 Item may not exhibit all these features or traits; yet such instances still retain their relationship to the same instance of F3 Manifestation Product Type.

The features that characterise a given instance of F3 Manifestation Product Type include: one instance of F41 Publication Expression, containing one or more than one instance of F2 Expression, reflecting the authors' content of the manifestation and all additional input by the publisher; and the appropriate types of physical features for that form of publication product. For example, "hardcover" and "paperback" are two distinct publications (i.e. two distinct instances of F3 Manifestation Product Type) even though authorial and editorial content are otherwise identical in both publications. The activity of cataloguing aims at the most accurate listing of features or traits of an instance of F3 Manifestation Product Type that are sufficient to distinguish it from another instance of F3 Manifestation Product Type. In this sense, it may be said that a typical bibliographic record for a publication (not a manuscript) reflects the notion of F3 Manifestation Product Type.

Examples: The publication product containing the text titled "Harmonie universelle" (authored by the person named "Marin Mersenne"), issued in 1636 in Paris by the publisher named "Sébastien Cramoisy"

The publication product containing a modern reprint of Marin Mersenne's "Harmonie universelle", issued in 1986 in Paris by the publisher named "Les éditions du CNRS", and identified by ISBN "2-222-00835-2"

The publication product containing the third edition of the combination of texts and graphics titled "Codex Manesse: die Miniaturen der großen Heidelberger Liederhandschrift, herausgegeben und erläutert von Ingo F. Walther unter Mitarbeit von Gisela Siebert", issued by the publisher named "Insel-Verlag" in 1988

The publication product containing the cartographic resource titled "Ordnance Survey Explorer Map 213, Aberystwyth & Cwm Rheidol", issued in May 2005 by the publisher named "Ordnance Survey" and identified by ISBN 0-319-23640-4 (folded), 1:25,000 scale

The publication product containing the recordings of musical works performed by the person named "Florence Foster Jenkins" gathered under the title "The Glory (????) of the human voice", identified by label and label number "RCA Victor Gold Seal GD61175" *(Note: the four question marks within parentheses belong to the title itself)*

Properties**:**

CLP2 should have type (should be type of): E55 Type
CLP43 should have dimension (should be dimension of): E54 Dimension
CLP45 should consist of (should be incorporated in): E57 Material
CLP46 should be composed of (may form part of): F3 Manifestation Product Type
CLP57 should have number of parts: E60 Number
CLP104 subject to (applies to): E30 Right

CLP105 right held by (right on): E39 Actor
CLR5 should carry (should be carried by): F41 Publication Expression

F4 Manifestation Singleton

Subclass of: E24 Physical Man-Made Thing

Scope note: This class comprises physical objects that each carry an instance of F2 Expression, and that were produced as unique object, with no siblings intended in the course of its production. It should be noted that if all but one copy of a given publication are destroyed, then that copy does not become an instance of F4 Manifestation Singleton, because it was produced together with sibling copies, even though it now happens to be unique. Examples of instances of F4 Manifestation Singleton include manuscripts, preparatory sketches and the final clean draft sent by an author or a composer to a publisher.

Examples: The manuscript known as "The Book of Kells"

The manuscript score of Charles Racquet's "Organ fantasy", included in Marin Mersenne's personal copy of his own "Harmonie universelle" (Marin Mersenne planned a second edition of his "Harmonie universelle" after it had been first published in 1636, and he asked the composer Charles Racquet to compose his organ fantasy especially for that planned second edition; but Mersenne died before he could finish and publish the second edition and Racquet's score remained until the 20th century as a manuscript addition to Mersenne's copy, held in Paris by the Library of the Conservatoire national des arts et métiers)

Marin Mersenne's personal copy, held in Paris by the Library of the Conservatoire national des arts et métiers, of his own "Harmonie universelle", containing all of his manuscript additions for a planned second edition that never took place before his death, but that served as a basis for the modern reprint published in 1986

Properties**:** **R7 is representative manifestation singleton for (has representative manifestation singleton): F2 Expression**

F5 Item

Subclass of: E84 Information Carrier

Scope note: This class comprises physical objects (printed books, scores, CDs, DVDs, CD-ROMS, etc.) that carry a F41 Publication Expression and were produced by an industrial process that follows a F39 Production Plan involving a F3 Manifestation Product Type.

Examples: Marin Mersenne's personal copy of his own "Harmonie universelle" without any manuscript addition and without Charles Racquet's manuscript score, as a mere witness of the 1st edition of "Harmonie universelle", Paris, 1636 (the same physical object can be regarded at the same time as an instance of F5 Item inasmuch as it is a witness of a publication, and as an instance of F4 Manifestation Singleton inasmuch as it contains manuscript annotations and additions and as it served as the basis for a subsequent production process)

Any other copy of the original edition of Marin Mersenne's "Harmonie universelle", Paris, 1636

Any copy of the modern reprint publication of Marin Mersenne's "Harmonie universelle", Paris, 1986, ISBN 2-222-00835-2

Properties: **R5 carries (is carried by): F41 Publication Expression**
R10 is example of (has example): F3 Manifestation Product Type

F7 Corporate Body

Equal to: E74 Group
Superclass of: F28 Bibliographic Agency

Scope note: This class comprises any gatherings or organisations of two or more people that act collectively or in a similar way due to any form of unifying relationship.

A gathering of people becomes an E74 Group when it exhibits organisational characteristics usually typified by a set of ideas or beliefs held in common, or actions performed together. These might be communication, creating some common artefact, a common purpose such as study, worship, business, sports, etc. Nationality can be modelled as membership in an E74 Group (cf. HumanML markup). (scope Note of CIDOC CRM E74 Group)

Examples: The International Machaut Society

The British Library

The Jackson Five

The Regional Municipality of Ottawa-Carleton

Italian Americans

F8 Person

Equal to: E21 Person

F9 Concept

Equal to: E28 Conceptual Object

Scope note: An abstract notion or idea. [FRBR] Includes fields of knowledge, disciplines, schools of thought, etc. Includes philosophies, religions, political ideologies, etc. Includes theories, processes, techniques, practices, etc. *[Definition from the FRAR model, unchanged]*

This class comprises non-material products of our minds, in order to allow for reasoning about their identity, circumstances of creation and historical implications. Characteristically, instances of this class are created, invented or thought by someone, and then may be documented or communicated between persons. Instances of E28 Conceptual Object need not have a particular carrier, but may be found on several different carriers, such as paper, electronic signals, marks, audio media, paintings, photos, human memory, etc. They cannot be destroyed as long as they exist on at least one carrier or in memory. Their existence ends when the last carrier is lost. A greater distinction can be made between products having a clear identity, such as a specific text, or photographs, and the ideas and concepts shared and traded by groups of people. *[Scope note for E28 Conceptual Object in CIDOC CRM version 4.0]*

Examples Mankind (as a concept)

Natural history of whales

Cultural history of Wales

Decision making in cataloguing

The influence of Zen philosophy on conceptual modelling

The appreciation of Victor Hugo's works in Germany between 1870 and 1914

Properties**:**

F10 Object

Equal to: E18 Physical Thing

Scope Note: This class comprises all persistent physical items with a relatively stable form, man-made or natural.

Depending on the existence of natural boundaries of such things, the CRM distinguishes the instances of E19 Physical Object from instances of E26 Physical Feature, such as holes, rivers, pieces of land etc. Most instances of E19 Physical Object can be moved (if not too heavy), whereas features are integral to the surrounding matter.

The CRM is generally not concerned with amounts of matter in fluid or gaseous states.

[Scope note for E18 Physical Object in CIDOC CRM version 4.2]

Examples: Buckingham Palace
The *Lusitania*
Apollo 11
The Eiffel Tower

Properties**:**

F11 Event

Equal to: E4 Period

Scope note: This class comprises sets of coherent phenomena or cultural manifestations bounded in time and space.
It is the social or physical coherence of these phenomena that identify an E4 Period and not the associated spatio-temporal bounds. These bounds are a mere approximation of the actual process of growth, spread and retreat. Consequently, different periods can overlap and coexist in time and space, such as when a nomadic culture exists in the same area as a sedentary culture.
Typically this class is used to describe prehistoric or historic periods such as the "Neolithic Period", the "Ming Dynasty" or the "McCarthy Era". There are however no assumptions about the scale of the associated phenomena. In particular all events are seen as synthetic processes consisting of coherent phenomena. Therefore E4 Period is a superclass of E5 Event. For example, a modern clinical E67 Birth can be seen as both an atomic E5 Event and as an E4 Period that consists of multiple activities performed by multiple instances of E39 Actor.
Artistic style may be modeled as E4 Period. There are two different conceptualisations of 'style', defined either by physical features or by historical context. For example, "Impressionism" can be viewed as a period lasting from approximately 1870 to 1905 during which paintings with particular characteristics were produced by a group of artists that included (among others) Monet, Renoir, Pissarro, Sisley and Degas. Alternatively, it can be regarded as a style applicable to all paintings sharing the characteristics of the works produced by the Impressionist painters, regardless of historical context. The first interpretation is consistent with E4 Period, and the second defines morphological object types that fall under E55 Type.
Another specific case of an E4 Period is the set of activities and phenomena associated with a settlement, such as the populated period of Nineveh.
Note that this class pertains to particular occurrences, and not to types of events such as "my birthday", which reoccurs periodically.

[Beginning of Scope note for E4Period in CIDOC CRM version 4.0]

[Note that in CIDOC CRM, E12 Production, E13 Attribute Assignment, and E65 Creation are

indirect subclasses of E4 Period = F11 Event; as a consequence, F11 Event is an indirect superclass of: F30 Work Conception, F31 Expression Creation, F33 Identifier Assignment, F36 Representative Manifestation Assignment, F37 Representative Expression Assignment, F40 Carrier Production Event, F44 Reproduction Event, and F45 Publication Event]

Examples: The battle of Trafalgar

Printing for the publisher named "Doubleday" in 2003 all the copies of the first print run of the novel titled "Da Vinci Code" (F40)

Having the initial idea that eventually resulted in the existence of the opera titled "Der fliegende Holländer" (F30)

Creating for Mozart's 41st symphony the uniform title that was thereafter consistently used to refer unambiguously to that symphony everywhere in the Library of Congress's catalogue (F33)

Properties**:**

F12 Place

Subclass of:

Scope note: This class comprises extents in space, in particular on the surface of the earth, in the pure sense of physics: independent from temporal phenomena and matter. The instances of E53 Place are usually determined by reference to the position of "immobile" objects such as buildings, cities, mountains, rivers, or dedicated geodetic marks. A Place can be determined by combining a frame of reference and a location with respect to this frame. It may be identified by one or more instances of E44 Place Appellation.

It is sometimes argued that instances of E53 Place are best identified by global coordinates or absolute reference systems. However, relative references are often more relevant in the context of cultural documentation and tend to be more precise. In particular, we are often interested in position in relation to large, mobile objects, such as ships. For example, the Place at which Nelson died is known with reference to a large mobile object – H.M.S Victory. A resolution of this Place in terms of absolute coordinates would require knowledge of the movements of the vessel and the precise time of death, either of which may be revised, and the result would lack historical and cultural relevance.

Any object can serve as a frame of reference for E53 Place determination. The model foresees the notion of a "section" of an E19 Physical Object as a valid E53 Place determination. *[Scope Note for E53 Place in CIDOC CRM version 4.0]*

Note that Places may be determined by the location of historical or contemporary objects, geographic features, events or geo-political units.

Examples: The area referred to as "Lutèce"
The area referred to as "verso of the title page of the 1st edition of the novel titled 'Da Vinci Code', as it presents itself in the copy that was used to create a bibliographic record for that edition in the Library of Congress's catalogue"

Properties**:**

F13 Name

Equal to: E41 Appellation
Superclass of: F14 Identifier

Scope note: This class comprises all proper names, words, phrases or codes, either meaningful or not, that are used or can be used to identify a specific instance of some class within a certain context. Instances of E41 Appellation do not identify objects by their meaning but by convention, tradition or agreement. From an implementation point of view, the E41 Appellation class is unlike most others, whose instances in a database can be considered as surrogates or references to real-world entities, in that each instance is nothing other than the E41 Appellation itself, i.e. the instance of E41 Appellation "Martin" is nothing other than the name "Martin" which should not be confused with any instance of F8 Person or persons called Martin. Specific subclasses of E41 Appellation should be used when instances of E41 Appellation of a characteristic form are used for particular objects. Instances of E49 Time Appellation, for example, which take the form of instances of E50 Date, can be easily recognised. E41 Appellation should not be confused with the act of naming something. cf. E15 Identifier Assignment *[Scope Note for E41 Appellation in CIDOC CRM version 4.0, except for the omission of one sentence]*

Examples: "杜甫" (E82) [the name of a Chinese poet of the 8th century, in Chinese characters]

"Du Fu" (E82) [Pinyin romanised form of the name of a Chinese poet of the 8th century]

"Tu Fu" (E82) [another romanised form of the name of a Chinese poet of the 8th century]

"Thơ Đô Phủ" (E82) [Vietnamese form of the name of a Chinese poet of the 8th century]

"جامعة صفاقس" (E82) [Arabic name of the Sfax University (Tunisia), in Arabic script]

"Ǧāmiʿāt Ṣafāqis" (E82) [Arabic name of the Sfax University (Tunisia), transliterated]

"Université de Sfax" (E82) [French name of the Sfax University (Tunisia)]

"Murders in the rue Morgue" (E35) [English title of a textual work]

"Poe, Edgar Allan, 1809-1849. Murders in the rue Morgue" (F14) [controlled author/title heading for a textual work]

Properties**:**

F14 Identifier

Subclass of: F13 Name (E41 Appellation)
Superclass of: E42 Object Identifier

Scope note: This class comprises strings assigned to entities in order to identify them uniquely and permanently within the context of one or more organisations. Such codes are often known as inventory numbers, registration codes, etc. and are typically composed of alphanumeric sequences. The class F14 Identifier is not normally used for machine-generated identifiers used for automated processing unless these are also used by human agents. *[adapted from the Scope Note of CIDOC CRM E42 Object Identifier]*

Examples: ISSN "0041-5278" (F14)

ISRC "FIFIN8900116" (F14)

Shelf mark "Res 8 P 10" (E42)

"Guillaume de Machaut (1300?-1377)" (F14) [a controlled personal name heading that follows the French rules]

"Guillaume, de Machaut, ca. 1300-1377" (F14) [a controlled personal name heading that follows the AACR rules]

"Rite of spring (Choreographic work : Bausch)" (F14)

Properties: **R51 consists of (forms part of): F13 Name**

F16 Identifier Rule

Subclass of: E29 Design or Procedure

Scope note: This class comprises sets of instructions relating to the formulation of a unique identifier

Examples: AACR2R 25.25-25.35F1

RAK-Musik (Revidierte Ausgabe 2003), Chapter 6

AFNOR Z 44-079

Properties:

F20 Self-Contained Expression

Subclass of: F2 Expression
Superclass of: F41 Publication Expression
F50 Performance Plan

Scope note: This class comprises the immaterial realisations of individual works at a particular time, that are regarded as a complete whole. The quality of wholeness reflects the intention of its creator that this expression should convey the concept of the work. Such a "whole" can in turn be part of a larger "whole".

Inherent to the notion of work is the completion of recognisable outcomes of the work. These outcomes, i.e. the Self-Contained Expressions, are regarded as the symbolic equivalents of Individual Works, which form the atoms of a complex work. A Self-Contained Expression may contain expressions or parts of expressions from other work, such as citations or items collected in anthologies. Even though they are incorporated in the Self-Contained Expression, they are not regarded as becoming members of the expressed container work by their inclusion in the expression, but are rather regarded as "foreign" or referred elements.

F20 Self-Contained Expression can be distinguished from F23 Expression Fragment in that an F23 Expression Fragment was not intended by its creator to make sense by itself. Normally creators would characterise an outcome of a work as finished. In other cases, one could recognise an outcome of a work as complete from the elaboration or logical coherence of its content, or if there is any historical knowledge about the creator deliberately or accidentally never finishing (completing) that particular expression. In all those cases, one would regard an expression as self-contained.

Examples: The Italian text of Dante's "Inferno" as found in the authoritative critical edition *La Commedia secondo l'antica vulgata a cura di Giorgio Petrocchi*, Milano: Mondadori, 1966-67 (= Le Opere di Dante Alighieri, Edizione Nazionale a cura della Società Dantesca Italiana, VII, 1-4)

The musical notation of Franz Schubert's lied known as "Ave Maria"

The musical notation of Franz Schubert's lieder cycle known as "Seven Songs after Walter Scott's The Lady of the Lake", of which "Ave Maria" is a distinct part

The musical notation of Franz Liszt's piano transcription of Franz Schubert's lied known as "Ave Maria"

Properties: **R63 incorporates (is incorporated in): F2 Expression**

F21 Complex Work

Subclass of: F1 Work
Superclass of: F22 Serial Work

Scope note: This class comprises works that have more than one work as members.

The members of a Complex Work may constitute components of the overall concept or be alternatives to other members of the work. In practice, no clear line can be drawn between parallel and subsequent processes in the evolution of a work. One part may not be finished when another is already revised. An initially monolithic work may be taken up and evolve in pieces. The member relationship of Work is based on the conceptual relationship, and should not be confused with the internal structural parts of an individual expression. The fact that an expression may contain parts from other work does not make the expressed work complex. For instance, an anthology for which only one version exists is not a complex work.

The boundaries of a Complex Work have nothing to do with the value of the intellectual achievement but only with the dominance of a concept. Thus, derivations such as translations are regarded as belonging to the same Complex Work, even though in addition they constitute an Individual Work themselves. In contrast, a Work that significantly takes up and merges concepts of other works so that it is no longer dominated by the initial concept is regarded as a new work. In cataloguing practice, detailed rules are established prescribing which kinds of derivation should be regarded as crossing the boundaries of a complex work. Adaptation and derivation graphs allow the recognition of distinct sub-units, i.e. a complex work contained in a larger complex work.

As a Complex Work can be taken up by any creator who acquires the spirit of its concept, it is never finished in an absolute sense.

Examples: "La Porte de l'Enfer" by Auguste Rodin (conceived between 1880 and 1917)

"Hamlet" by William Shakespeare (complex due to the versions, translations and derivations)

"Der Ring der Nibelungen" by Richard Wagner (complex due to structural parts and versions)

"Carceri d'invenzione" by Giovanni Battista Piranesi (a complex work in 2 senses: it comprises a number of individual engravings, and each engraving is available in more than one state)

Bach's Mass in B minor BWV 232 [consisting mostly of pre-existing musical material, re-arranged into a new whole]

Properties:

R12 has member (is member of): F1 Work
R13 is realised in (realises): F20 Self-Contained Expression

F22 Serial Work

Subclass of: F21 Complex Work
F43 Publication Work

Scope note: This class comprises works that are, or have been, planned to result in sequences of manifestations with common features. Whereas a work can acquire new members over the time it evolves, Expressions and Manifestations are identified with a certain state achieved at a particular point in time. Therefore there is in general no single expression or manifestation representing a complete serial work, unless the serial work is ended.

Serial Works may or may not have a plan for an overall expression.

The retrospective reprinting of all issues of a Serial Work at once, in the form of a monograph, is regarded to be another member of a Complex Work, which contains the Serial Work and the Individual Work realised in the monograph. This does not make the monograph part of the Serial Work.

Examples: The periodical titled "The UNESCO Courier", ISSN 0041-5278

The periodical titled "Courrier de l'UNESCO", ISSN 0304-3118 [French edition of the periodical titled "The UNESCO Courier", ISSN 0041-5278]

The series titled "L'évolution de l'humanité", ISSN 0755-1843 [a monograph series comprising volumes that were published from 1920 on, and some of which were reprinted, with different physical features and rearranged in a different order, from 1968 on, in a distinct series also titled "L'évolution de l'humanité", ISSN 0755-1770]

Properties**:**

R62 has issuing rule (is issuing rule of): E29 Design or Procedure

F23 Expression Fragment

Subclass of: F2 Expression

Scope note: This class comprises parts of Expressions and these parts are not Self-contained Expressions themselves.

The existence of an instance of F23 Expression Fragment can be due to accident, such as loss of material over time, e.g. the only remaining manuscript of an antique text being partially eaten by worms, or due to deliberate isolation, such as excerpts taken from a text by the compiler of a collection of excerpts.

An F23 Expression Fragment is only identified with respect to its occurrence in a known or assumed whole. The size of an instance of F23 Expression Fragment ranges from more than 99% of an instance of F20 Self-Contained Expression to tiny bits (a few words from a text, one bar from a musical composition, one detail from a still image, a two-second clip from a movie, etc.).

Examples: The only remnants of Sappho's poems

The words "Beati pauperes spiritu" (excerpted from Matthew's Gospel 5,3 in Latin translation)

The notes G-G-G-Eflat (opening of the 1st movement of Ludwig van Beethoven's 5th symphony) performed by an orchestra, recorded, and broadcast by the BBC during World War II (the rhythm of this musical fragment corresponds to the Morse code for the initial "V" for "Victory")

The graphic content of a digitised enlarged detail of Mona Lisa's left eye

Properties**:**

R15 is fragment of (has fragment): F2 Expression

F28 Bibliographic Agency

Subclass of: F7 Corporate Body

Scope note: This class comprises agents who create the bibliographic description of publications and perform the authority control associated with such descriptions, for the description of copies of such publications actually held by libraries, and for the description of unique documents (manuscripts, objects…) held by libraries.

The activity of creating such descriptions implies that one has to make decisions (as to the

uniform title for a work, as to whether an arrangement still belongs to the same work or is definitely a new work, etc.). Since such decisions always are debatable and different agencies can make different decisions about the same real-world entities, it is important to document which agency made which decision.

Examples: The National Library of France, identified in bibliographic and authority records by the code "FRBNF" at the beginning of INTERMARC field 001

Properties:

F30 Work Conception

Subclass of: E65 Creation

Scope note: This class comprises the births of original ideas. It marks the initiation of the creation of a work. This class should be used where there is historical evidence of the initiation before the appearance of physical evidence for the F1 Work. This does not always correlate with the date assigned in common library practice to the work; which is usually a later event.

Examples: Richard Wagner's having the initial idea of composing the opera titled "Der fliegende Holländer" during a stormy sea crossing in July/August 1839

Oscar Wilde's having by May 1897 the initial idea of writing his poem titled "The ballad of the Reading gaol", inspired by his stay in the Reading prison from November 20, 1895 to May 18, 1897, and the execution of Charles Thomas Woolridge on July 7, 1896

Properties**:**

R21 initiated (was initiated by): F1 Work

F31 Expression Creation

Subclass of: E12 Production
E65 Creation
Superclassof: F55 Recording Event
Scope note: This class comprises activities that result in instances of F2 Expression coming into existence. This class characterises the externalisation of an Individual Work.

Although F2 Expression is an abstract entity, a conceptual object, the creation of an expression inevitably also affects the physical world: when you scribble the first draft of a poem on a sheet of paper, you produce a F4 Manifestation – Singleton; F31 Expression Creation is a subclass of E12 Production because the recording of the expression causes a physical modification of the carrying E18 Physical Thing. The work becomes manifest by being expressed on a physical carrier different from the creator's mind. The spatio-temporal circumstances under which the expression is created are necessarily the same spatio-temporal circumstances under which the first F4 Manifestation Singleton is produced. The mechanisms through which *oral tradition* (of myths, tales, music, etc.) operates are not further investigated in this model. As far as bibliographic practice is concerned, only those instances of F2 Expression that are externalised on physical carriers other than both the creator's mind and the auditor's mind are taken into account (for a discussion of the modelling of oral traditions, see: Nicolas, Yann. "Folklore Requirements for Bibliographic Records: oral traditions and FRBR." In: *Cataloging & Classification Quarterly* (2005). Vol. 39, No. 3-4. P. 179-195).

Examples: The creation of the original manuscript score of "Uwertura tragiczna" by Andrzej Panufnik in 1942 in Warsaw

The reconstruction from memory of the manuscript score of "Uwertura tragiczna" by Andrzej Panufnik in 1945 after the original score was destroyed during the war

The recording of the third alternate take of "Blue Hawaii" performed by Elvis Presley in Hollywood, Calif., Radio Recorders, on March 22nd, 1961 [each individual performance and

take is a distinct instance of F2 Expression]

Properties:

R22 created (was created by): F2 Expression
R45 created (was created by): F4 Manifestation Singleton
R49 created a realisation of (was realised through): F46 Individual Work

F33 Identifier Assignment

Subclass of: E13 Attribute assignment
Superclass of: E15 Identifier Assignment

Scope note: This class comprises activities that result in the allocation of an identifier to any Entity. An Identifier Assignment may include the creation of the identifier from multiple constituents. The syntax and kinds of constituents to be used may be declared in a rule. It also includes the assignment of uniform titles.

Examples: Assigning the author-title heading "Goethe, Johann Wolfgang von, 1749-1832. Faust. 1. Theil." as a uniform title for a work

Assigning the title heading "Bible. English. American Standard" as a uniform title for an expression

Properties:

R24 assigned to (was assigned by): E1 CRM Entity
R25 assigned (was assigned by): F14 Identifier
R26 used constituent (was used in): F13 Name
R52 used rule (was the rule used in): F16 Identifier Rule

F36 Representative Manifestation Assignment

Subclass of: E13 Attribute Assignment

Scope note: This class comprises activities through which an Agency declares (implicitly or explicitly) that a given instance of F3 Manifestation Product Type or F4 Manifestation Singleton is representative for a given F2 Expression, i.e., that some features found on that instance of F3 Manifestation Product Type or F4 Manifestation Singleton (most prominently, information about the title) can be inferred to also apply to that instance of F2 Expression, no matter within which manifestation it is embodied.

The reasoning behind is that the Work title is known through the title of an Expression that is deemed representative of the Work, and the title of the representative Expression is known through the title proper of a Manifestation that is deemed representative of the Expression representative of the Work.

Examples: By using the title proper "Mrs Dalloway" found on the first edition of a novel by Virginia Woolf as the basis for a uniform title for that novel, rather than the title proper "The hours" found on the manuscripts held by the British Library, an Agency implicitly states that the printed edition (instance of F3 Manifestation Product Type) is representative for the instance of F2 Expression that is representative for the F1 Work, whereas the hand-written instances of F4 Manifestation Singleton are not

By not using the title proper "The tragicall historie of HAMLET Prince of Denmarke" found on an instance of F3 Manifestation Product Type as the basis for a uniform title heading for a work by Shakespeare, an Agency explicitly states that that instance of F3 Manifestation Product Type is not representative (at least, as far as title information is concerned) for an F2 Expression of Shakespeare's F1 Work *Hamlet*

Selecting the manuscript identified by shelfmark "MS-8282" within the collections of the

National Library of France, Department for Music, as representative for the musical text of Stanislas Champein's opera "Vichnou" [explanation: the BnF's Department for Music holds 3 manuscript scores (identified by shelfmarks "MS-8282", "MS-13778", and "MS-17321") for this opera; the title inscribed on MS-8282 is "Vichnou", while MS-13778 and MS-17321 are titled "Vistnou"; the authorised form chosen by cataloguers and reference tools such as the Grove Dictionary for Opera is "Vichnou", while "Vistnou" is recorded in the BnF's authority file only as a cross reference]

Properties**:**

R16 carried out by (performed): F28 Bibliographic Agency
R31 assigned to (was assigned by): F2 Expression
R32 assigned (was assigned by): F3 Manifestation Product Type
R53 assigned (was assigned by): F4 Manifestation Singleton

F37 Representative Expression Assignment

Subclass of: E13 Attribute Assignment

Scope note: This class comprises activities through which an Agency declares (implicitly or explicitly) that a given instance of F2 Expression is representative for a given F21 Complex Work, i.e., that some attributes of that instance of F2 Expression (most prominently, information about the title) can be inferred to also apply to that instance of F21 Complex Work, no matter in which particular expression it is realised.

The reasoning behind is that the Work title is known through the title of an Expression that is deemed representative of the Work, and the title of the representative Expression is known through the title of a Manifestation that is deemed representative of the Expression that is representative of the Work.

For instance, by using the qualified uniform title "Poe, Edgar Allan, 1809-1849. Murders in the rue Morgue (French)" for the French rendition of Poe's *Murders in the rue Morgue* by Baudelaire, an Agency implicitly states that the French text does not constitute a representative F2 Expression for Poe's F1 Work, however the original English text does constitute a representative F2 Expression for Poe's F1 Work.

Examples: Choosing the English text titled "Murders in the rue Morgue", with that particular formulation of its title, as representative for the complex work Edgar Allan Poe's "Murders in the rue Morgue"

Properties**:**

R17 carried out by (performed): F28 Bibliographic Agency
R33 assigned to (was assigned by): F21 Complex Work
R34 assigned (was assigned by): F2 Expression

F39 Production Plan

Subclass of: E29 Design or Procedure

Scope note: This class comprises sets of instructions prescribing the production of a number of F5 Items all of which are instances of the same instance of F3 Manifestation Product Type (i.e. exemplars of that class which is an instance of the F3 Manifestation Product Type).

Typically, the characteristics of the F4 Manifestation Singleton on which an F39 Production Plan is based should thereafter be found on all items of the Manifestation Product Type.

An F39 Production Plan may be reused long after the initial production event (F40 Carrier Production Event) occurred, for example in further print runs.

Examples: The set of instructions at the origin of the production of copies of the 3rd edition of "Codex Manesse: die Miniaturen der großen Heidelberger Liederhandschrift, herausgegeben und erläutert von Ingo F. Walther unter Mitarbeit von Gisela Siebert", Insel-Verlag, 1988 [a fac-simile edition of an illuminated mediaeval manuscript]

The set of instructions at the origin of the production of copies of the "Ordnance Survey Explorer Map 213, Aberystwyth & Cwm Rheidol", ISBN 0-319-23640-4 (folded), 1:25,000 scale, released in May 2005 [a cartographic resource]

The set of instructions at the origin of the production of copies of the sound recording titled "The Glory (????) of the human voice", RCA Victor Gold Seal GD61175, containing recordings of musical works performed by Florence Foster Jenkins [the question marks in parentheses belong to the original title – F. F. Jenkins is famous as one of the worst singers ever]

The set of instructions (dated 1972 and reused in 1978 for a second print run) at the origin of the production of copies of "The complete poems of Stephen Crane, edited with an introduction by Joseph Katz" (ISBN "0-8014-9130-4") [publication of a printed text]

Properties**:** **R37 shows how to realise (was realised by): F3 Manifestation Product Type**

F40 Carrier Production Event

Subclass of: E12 Production

Scope note: This class comprises activities that result in instances of F5 Item coming into existence. The creation of a new copy of a file on an electronic carrier is also regarded as a carrier Production Event.

Typically, the production of copies of a publication (no matter whether it is a book, a sound recording, a DVD, a cartographic resource, etc.) follows an instance of F39 Production Plan provided by the publisher, and strives to produce all items as similar as possible to a prototype that displays all the features that all the copies of the publication should also display. These two characteristics (i.e., the existence of a production plan and the existence of a physical prototype that all copies should mimic) are reflected in properties *R39 followed* F39 Production Plan, and *R40 used as source material* E84 Information Carrier.

Examples: The printing of copies of the 3rd edition of "Codex Manesse: die Miniaturen der großen Heidelberger Liederhandschrift, herausgegeben und erläutert von Ingo F. Walther unter Mitarbeit von Gisela Siebert", Insel-Verlag, 1988 [a fac-simile edition of an illuminated mediaeval manuscript]

The printing of copies of the "Ordnance Survey Explorer Map 213, Aberystwyth & Cwm Rheidol", ISBN 0-319-23640-4 (folded), 1:25,000 scale, released in May 2005 [a cartographic resource]

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My clicking now on the link <http://cidoc.ics.forth.gr/docs/cidoc_crm_version_4.0.pdf>, and thus downloading on my PC a reproduction of the electronic file titled "Definition of the CIDOC Conceptual Reference Model… version 4.0" that is stored on the ICS FORTH's servers in Heraklion, Crete

The second print run, in 1978, of "The complete poems of Stephen Crane, edited with an introduction by Joseph Katz" (ISBN "0-8014-9130-4"), a publication dated of 1972 [publication of a printed text]

Properties**:**

R38 produced things of type (was produced by): F3 Manifestation Product Type
R39 followed (was followed by): F39 Production Plan
R40 used as source material (was used by): F41 Publication Expression
R41 produced (was produced by): F5 Item

F41 Publication Expression

Subclass of: F20 Self-Contained Expression

Scope note: This class comprises the complete layout and content provided by a publisher (in the broadest sense of the term) in a given publication and not just what was added by the publisher to the authors' expressions. It comprises the expressions of the authors' Works that constitute the raison d'être for the publication. Frequently, it also comprises illustrations selected by the publisher from different artists.

Examples: The text, its layout and the textual and graphic (Saur's logo on p. [i]) content of front and back cover, spine (spine title), and p. [i-iv] of the publication titled "Functional Requirements for Bibliographic Records: final report", published by K. G. Saur in 1998, identified by ISBN "3-598-11382-X"

The overall content of the book identified by ISBN "0-8014-9130-4": the text of Stephen Crane's complete poems as edited by Joseph Katz, the numbering system introduced by Joseph Katz in order to identify each individual poem by Stephen Crane, page numbers, the text of Joseph Katz's dedication, preface, acknowledgements, and introduction, the table of contents, the index of first lines, the statements found on title page, back of title page (including CIP bibliographic record), cover front, back front, and spine, and the layout of the publication; for one of Stephen Crane's longer poems, printed on p. 142-143, a statement reads at bottom of p. 142: "[NO STANZA BREAK]": obviously, this statement does not belong to the Self-Contained Expression intended by Stephen Crane, and presumably not to the one intended by editor Joseph Katz either, but was more probably added by the publishing team, due to characteristics of the layout of the publication: a cautious reader can easily interpret "[NO STANZA BREAK]" as non-belonging to the poem itself, but an OCR process would not make the distinction between the text of the poem and the statement made by the publisher; "[NO STANZA BREAK]" belongs to the Publication Expression, although it does not belong to the Self-Contained Expression intended by Stephen Crane and Joseph Katz

The overall content of the LP sound recording identified by label and label number "CBS 34-61237": a recorded performance of Terry Riley's musical work "In C", the text of liner notes by Paul Williams translated into French by Bernard Weinberg, technical statements such as "Stereo," publisher's logo, series logo, title and statement of responsibility on front, back, and spine of the cover and on the recording itself, duration statement, cover art by G. Joly, overall layout, etc.; a special, shunting sound was added at the end of side one and beginning of side two, as Terry Riley's work is in the form of a continuous musical flow without any interruption and the technical possibilities of vinyl LPs did not allow the complete performance to be contained on just one side: that special, shunting sound was not intended in Riley's score nor in the performance but was added by the publisher (with or without Riley's consent, this detail is not documented), and as such it is part of the Publication Expression although it is not part of the composer's and the performers' Self-Contained Expression (this shunting sound was no longer needed in subsequent releases on CD)

The overall content of the DVD titled "The Aviator (2-Disc Full Screen Edition)", released in 2004: Martin Scorsese's movie itself; layout of the box and the two DVDs contained in the box; pictures on the DVDs themselves; English, Spanish, and French subtitles; English and French audio tracks; and bonuses: commentaries by director Martin Scorsese, editor Thelma Schoonmaker, and producer Michael Mann; a deleted scene ("Howard Tells Ava About His Car Accident"); and featurettes "A Life Without Limits: The Making of The Aviator"; "The Role of Howard Hughes in Aviation History"; "Modern Marvels: Howard Hughes, A Documentary by the History Channel"; "The Visual Effects of The Aviator"; "The Affliction of Howard Hughes: Obsessive Compulsive Disorder"; "The Age of Glamour: The Hair And

Makeup of The Aviator"; "Costuming The Aviator: The Work of Sandy Powell"; "Constructing The Aviator: The Work of Dante Ferretti"; "An evening with Leonardo DiCaprio and Alan Alda"; "OCD Panel Discussion With Leonardo DiCaprio, Martin Scorsese, and Howard Hughes' Widow Terry Moore"; "Still Gallery"; "Scoring The Aviator: The Work Of Howard Shore"; and "The Wainwright Family – Loudon, Rufus and Martha"

Properties**:**

F43 Publication Work

Subclass of: F54 Container Work
Superclass of: F22 Serial Work

Scope note: This class comprises *works that have been planned to result in* a manifestation product type and that pertain to the rendering of expressions from other works.

Examples: The ideas associated with releasing of the 2CD set titled "Mystic chants", released in 2001 by CD publisher Nocturne, containing one CD with recorded performances of works by Hildegard von Bingen, titled "The revelation of Hildegard von Bingen", and one CD containing recorded performances of Bulgarian traditional music, titled "Le mystère des voix bulgares"; both CDs were pre-existing and were not originally intended to be published together; the publication work titled "Mystic chants" consists in putting them together, creating the cover and making an instance of F41 Publication Expression

The concept, on behalf of publisher named "Verlag Neue Kunsthandlung", of issuing together, around 1925, three formerly independent publications ("Emil Orlik" by Max Osborn – vol. 2 within the series named "Graphiker der Gegenwart", published in 1920; "Anders Zorn" by Paul Friedrich – vol. 10 within the series named "Graphiker der Gegenwart", published in 1924; and "Max Slevogt" by Julius Elias – vol. 11 within the series named "Graphiker der Gegenwart", published in 1923) as one, new publication, titled "102 Bilder aus der Sammlung 'Graphiker der Gegenwart'"

The concept, on behalf of publisher named "Dell", of issuing together in 2002 three novels, titled "The partner", "The street lawyer", and "A time to kill", by author named "John Grisham"; on the box that contains the three separate volumes (in no way different from their original publication), a statement reads: "Three #1 bestsellers by John Grisham"

Properties**:**

F44 Reproduction Event

Subclass of: E12 Production

Scope note: This class comprises activities that consist in making copies, more or less mechanically, of an instance of E84 Information Carrier (such as an F5 Item or an F4 Manifestation Singleton which is also instance of E84 Information Carrier), preserving the expression carried by it. A Reproduction Event results in new instances of E84 Information Carrier coming into existence. In general, the copy will have different attributes from the original and they are therefore not regarded as siblings.

This class makes it possible to account for the legal distinction between private copying for the purpose of "fair use," and mass production for the purpose of dissemination.

It can prove difficult to determine where to draw the line between F44 Reproduction Event and F40 Carrier Production Event in cases where multiple copies are produced. In this case, the copies, but not the original, may be regarded as instances of F5 Item. It is the existence of an explicit production plan that makes the difference. As a consequence, F44 Reproduction Event and F40 Carrier Production Event are not declared as *disjoint,* which makes it possible to

account for such situations that could be regarded as instances of both Production Event and Reproduction Event.

Examples: My photocopying now for my own private use an exemplar of the article titled "Federal Court's Ruling Against Photocopying Chain Will Not Destroy 'Fair Use'" by Kenneth D. Crews, issued in "Chronicle of higher education", 17 April 1991, A48

The BnF's producing in 1997 the microfilm identified by call number "Microfilm M-12169" of the exemplar identified by shelf mark "Res 8 P 10" of Amerigo Vespucci's "Mundus novus" published in Paris ca. 1503-1504

The BnF's reproducing in 2001 the exemplar identified by call number "NC His Master's Voice HC 20" of a 78 rpm phonogram released by Gramophone in 1932, as part of the CD identified by call number "SDCR 2120"

The BnF's making in 2003 a digitisation, identified by call number "IFN 7701015", of the collection of drawings (held by the BnF) that were made by Étienne-Louis Boullée in 1784 for his project of a "Newton Cenotaph"

Properties**:**

R59 reproduced (was reproduced by): E84 Information Carrier
R60 produced (was produced by): E84 Information Carrier

F45 Publication Event

Subclass of: E65 Creation

Scope note: This class comprises the activities of publishing. Such an event includes the creation of a Publication Plan and setting up the means of production. The end of this event is regarded as the date of publication, regardless of whether the carrier production is started. Publishing can be either physical or electronic. Electronic publishing is regarded as making an instance of F41 Publication Expression available in electronic form on a public network. Electronic Publishing does not mean producing a physical F5 Item by partially electronic means. Making an electronic file available on a physical carrier can be regarded as equivalent to setting up the means of production; downloading the file is regarded as the electronic equivalent of F40 Carrier Production Event.

Examples: Publishing Amerigo Vespucci's "Mundus novus" in Paris ca. 1503-1504

Establishing in 1972 the layout, features, and prototype for the publication of "The complete poems of Stephen Crane, edited with an introduction by Joseph Katz" (ISBN "0-8014-9130-4"), which served for a second print run in 1978

Making available online the article by Allen Renear, Christopher Phillippe, Pat Lawton, and David Dubin, titled "An XML document corresponds to which FRBR Group 1 entity?", indifferently as an HTML file (<http://www.mulberrytech.com/Extreme/Proceedings/html/2003/Lawton01/EML2003Lawton01.html>), a PDF file (<http://www.mulberrytech.com/Extreme/Proceedings/xslfo-pdf/2003/Lawton01/EML2003Lawton01.pdf>), or an XML file (<http://www.mulberrytech.com/Extreme/Proceedings/xml/2003/Lawton01/EML2003Lawton01.xml>)

Making available online the content of the manuscript Keynes Ms 130.4 (King's College, Cambridge) (John Conduitt's account of Newton's life at Cambridge), either in normalised transcription (<http://www.newtonproject.ic.ac.uk/texts/viewtext.php?id=THEM00167&mode=normalized>), or in diplomatic transcription (<http://www.newtonproject.ic.ac.uk/texts/viewtext.php?id=THEM00167&mode=diplomatic>)

Properties**:**

R55 created production plan (was created by): F39 Production Plan

F46 Individual Work

Subclass of: F1 Work
Superclass of: F48 Aggregation Work
Scope note: This class comprises works that are realised by one and only one self-contained expression, i.e., works representing the concept as expressed by precisely this expression, and that do not have other works as parts.

Inherent to the notion of work is the completion of recognisable outcomes of the work. These outcomes, i.e. the Self-Contained Expressions, are regarded as the symbolic equivalents of Individual Works, which form the atoms of a complex work. Normally creators would characterise an outcome of a work as finished. In other cases, one could recognise an outcome of a work as complete from the elaboration or logical coherence of its content, or if there is any historical knowledge about the creator deliberately or accidentally never finishing (completing) that particular expression. In all those cases, one would regard the corresponding expression as equivalent to one Individual Work.

Examples: Abstract content of Giovanni Battista Piranesi's "Carcere XVI: the pier with chains: 1st state"

Abstract content of Giovanni Battista Piranesi's "Carcere XVI: the pier with chains: 2nd state" [explanation: these are two states of the "same" etching, but with so many and so significant differences between them that they can scarcely be recognised as conveying the "same" work; more generally speaking, each individual state of an etching, as a Self-Contained Expression, conveys its own Individual Work (even if the differences are not so blatant as in the case of "Carcere XVI"), and is regarded as part of the larger, abstract Complex Work that encompasses all distinct states of the "same" etching.

Abstract content of the recorded performance of Johann Sebastian Bach's "Toccata in C minor BWV 911" by Glenn Gould on May 15 & 16, 1979, in Toronto, Eaton's Auditorium [explanation: Gould was equally blamed and praised for his "unconventional" performances; one critic even wrote that "for Gould, any recording is a work to create"; and yet, Gould did not add anything to, change anything in, nor delete anything from Bach's score; more generally speaking, any performance of a musical work conveys its own concept, in addition to the work's concept]

Properties**:** **R56 is realised in (realises): F20 Self-Contained Expression**

F48 Aggregation Work

Subclass of: F54 Container Work
Superclass of:
Scope note: This class comprises works whose essence is the selection and/or arrangement of expressions of other works. This does not make the contents of the aggregated expressions part of this work, but only parts of the resulting expression. F48 Aggregation Work may include additional original parts.

An expression of a work may include expressions of other works within it. For instance, an anthology of poems is regarded as a work in its own right that makes use of expressions of the individual poems that have been selected and ordered as part of an intellectual process.

A new version of a container work does not make the resulting complex work a container work as well. The inclusion of expressions from a complex work in an aggregation work does not make the aggregation work itself complex.

Examples: The aggregation and arrangement concept of the anthology titled "American Women Poets of the Nineteenth Century: An Anthology", edited by Cheryl Walker and published by Rutgers University Press in July 1992

The aggregation and arrangement concept of the Web site titled "IFLANET" (F43)

The aggregation and arrangement concept of Volume 39, Numbers 3/4 of the periodical titled "*Cataloging & Classification Quarterly*"

The aggregation and arrangement concept of the collection of articles titled “Marij Kogoj (1892-1992) : zbornik referatov s kolokvija ob stoletnici skladateljevega rojstva 7.10.1992 v Ljubljani = Marij Kogoj (1892-1992) : proceedings from the colloquium held in Ljubljana at the centenary of the composer’s birth on October 7th, 1992 / uredil Ivan Klemenčič”

Properties**:**

F50 Performance Plan

Subclass of: F20 Self-Contained Expression
E29 Design or Procedure

Superclass of:

Scope note: This class comprises sets of directions to which individual performances of theatrical, choreographic, or musical works and their combinations should conform.

In the case of theatrical performances, such directions incorporate, but are not limited nor reducible to, the text of a given version of the play performed (e.g., a translated text, some passages of which are deliberately omitted, with some rephrased lines, etc.).

In the case of choreographic performances, such directions may include, but are not limited nor reducible to, the notation of choreographic movements in systems such as labanotation.

In the case of musical performances, such directions may include, but are not limited nor reducible to, the musical score. In case of electronic music, they may include software instructions.

These directions may or may not completely determine the form of the intended performance. Depending on the nature of the directions, the form of the intended performance, such as the sets of movements or the soundness, may or may not be predictable from the directions.

Note that a performance plan may be more or less elaborate, and may even foresee just improvisation.

Examples: The set of instructions for the production of a Yiddish translation of the textual work known as “King Lear”, as directed by Sergei Radlov in Moscow in 1935

The set of instructions for the production of the ballet titled “Rite of spring”, as choreographed by Pina Bausch in Wuppertal in 1975

The set of instructions by Bruno Walter for performing Gustav Mahler’s 9th symphony, delivered by him to the Columbia Symphony Orchestra during rehearsals in Hollywood in 1961 (as partially documented in the CD titled “Bruno Walter conducts and talks about Mahler symphony No. 9 : rehearsal & performance”)

The set of instructions contained in the “performance handbook” for Luigi Nono’s musical work titled “À Pierre”

Properties**:**

F51 Performance Work

Subclass of: F54 Container Work
Superclass of:

Scope note: This class comprises the sets of concepts for rendering a particular or a series of like performances.

F51 is declared as a subclass of F54 Container Work. This implies that the incorporated expressions (such as the text of the staged play, the text of the argument for the ballet, the recorded music for the ballet, or the content of the musical score for a concert) are not by themselves a "part" of the expression of this Work. Rather, an expression (F50 Performance Plan) of the instructions the stage production, choreography or musical performance consists of *incorporates* (R63) that textual or musical content. In other words, the text of *Hamlet* is not a component of the concepts that underlie a given mise-en-scène of *Hamlet*, but any staging directions (F50 Performance Plan) that convey a given director's vision of *Hamlet* must necessarily "incorporate" the text of *Hamlet*.

Examples: The conceptual content of Sergei Radlov's mise-en-scène of a Yiddish translation of the textual work known as "King Lear" in Moscow in 1935

The conceptual content of Pina Bausch's choreography of the ballet titled "Rite of spring" in Wuppertal in 1975

The conceptual content of Bruno Walter's performance of Gustav Mahler's 9th symphony in 1961

The conceptual content of the "performance handbook" for Luigi Nono's musical work titled "À Pierre"

Properties: **R69 is realised in (realises):F50 Performance Plan**

F52 Performance

Subclass of: E7 Activity
Superclass of:

Scope note: This class comprises activities that follow the directions of a performance plan, such as a theatrical play, an expression of a choreographic work or a musical work. I.e. they are intended to communicate directly or indirectly to an audience.

Such activities can be identified at various levels of granularity, and can be contiguous or not. Any individual performance (with or without intermissions) is a single instance of F52 Performance. In addition, a complete run of performances can also be seen as an instance of F52 Performance, with individual performances as parts. A complete run of performances may comprise an original run plus any of its extensions and tours.

Note that a performance plan may be more or less elaborate, and may even foresee just improvisation.

Examples: Performing the first performance of a Yiddish translation of the textual work known as "King Lear", as directed by Sergei Radlov, in Moscow, at the Moscow State Jewish Theatre, on February 10, 1935 [individual performance]

Performing the ballet titled "Rite of spring", as choreographed by Pina Bausch, in Avignon, at the Popes' Palace, on July 7, 1995 [individual performance]

Performing the operatic work titled "Dido and Aeneas", as directed by Edward Gordon Craig and conducted by Martin Shaw, in London, Hampstead Conservatoire, on May 17, 18, and 19, 1900 [run of performances]

Properties**:**

R64 performed (was performed in): F50 Performance Plan

F53 Recording Work

Subclass of: F1 Work
Superclass of:

Scope note: This class comprises works that conceptualise the capturing of features of perdurants.

The characteristics of the recording work are those of the way of capturing. The characteristics of the manifestation of a recording work are those of the product of the capture.

The characteristics of the works recorded are distinct from those of the recording itself.

Examples: The concept of the recording of performances of Gustav Mahler's 9th symphony by the Columbia Symphony Orchestra conducted by Bruno Walter in Hollywood, American Legion Hall, in January and February 1961

Properties**:**

R70 is realised in (realises): F56 Recording

F54 Container Work

Subclass of: F1 Work
Superclass of: F48 Aggregation Work
F43 Publication Work
F51 Performance Work

Scope note: This class comprises works whose essence is to enhance or add value to expressions from other works without altering them, by the selection, arrangement and/or addition of features of different form, such as layout to words, recitation and movement to texts, instrumentation to musical scores etc. This does not make the contents of the incorporated expressions part of the Container Work, but only part of the resulting expression. Container Work may include the addition of new, original parts to the incorporated expressions, such as introductions, graphics, etc..

A new version of a container work does not make the resulting complex work a Container Work as well. The inclusion of expressions from a complex work in a Container Work does not make the Container Work itself complex.

Examples: The aggregation and arrangement concept of the anthology titled "American Women Poets of the Nineteenth Century: An Anthology", edited by Cheryl Walker and published by Rutgers University Press in July 1992 [an F48 Aggregation Work]

The concept for the layout created by printer Guido Morris for the text of Michael Hamburger's English translation of 12 poems by Georg Trakl for publication in 1952 [an F43 Publication Work]

The concept by the publisher named "Dell" of issuing together, in 2002, three novels entitled "The Partner", "The Street Lawyer", and "A time to kill", by the author named "John Grisham"; on the box that contains the three separate volumes, in no way different from their original publication. (A statement reads: "Three #1 bestsellers by John Grisham") [an F43 Publication Work]

The concept of Sergei Radlov's mise-en-scène of a Yiddish translation of the textual work known as "King Lear" in Moscow in 1935 [an F51 Performance Work]

F55 Recording Event

Subclass of: F31 Expression Creation

Superclass of:

Scope note: This class comprises activities of capturing features of perdurants.

Examples: The making of the recording of the third alternate take of the musical work titled “Blue Hawaii” as performed by Elvis Presley in Hollywood, Calif., Radio Recorders, on March 22nd, 1961

Properties**:** **R66 recorded (was recorded through): E5 Event**
R67 created (was created through): F56 Recording
R68 realised (was realised through): F53 Recording Work

F56 Recording

Subclass of: F2 Expression
Superclass of:

Scope note: ?????

Examples: The set of signs that make up the third alternate take of the musical work titled “Blue Hawaii” as performed by Elvis Presley in Hollywood, Calif., Radio Recorders, on March 22nd, 1961

Properties:

FRBR Property Declaration

R1 has constraining supertype (is constraining supertype of)

Domain: F1 Work
Range: E55 Type
Superproperty of:
Subproperty of: P2 has type (is type of)

Quantification: (1:1,0:n)

Scope note: This property associates an instance of F1 Work with an instance of E55 Type that any expression of that work should also have for it to be identified as an expression of the same work.

The nature of what constitutes a "constraining supertype" varies according to cataloguing rules and conventions. As the entity-relationship version of FRBR puts it, "The concept of what constitutes a *work* and where the line of demarcation lies between one *work* and another may in fact be viewed differently from one culture to another. Consequently the bibliographic conventions established by various cultures or national groups may differ in terms of the criteria they use for determining the boundaries between one *work* and another." (FRBR Final Report, p. 16).

Examples: Shakespeare's textual work titled "Hamlet" (F21) *R1 has constraining supertype* Textual work (E55)

Kenneth Branagh's cinematic work titled "Hamlet" (F21) *R1 has constraining supertype* Cinematic work (E55)

Mozart's musical work titled "Don Giovanni" (F21) *R1 has constraining supertype* Musical work (E55)

Joseph Losey's cinematic work titled "Don Giovanni" (F21) *R1 has constraining supertype* Cinematic work (E55)

R2 has representative expression (is representative expression for)

Domain: F1 Work
Range: F20 Self-contained Expression
Superproperty of:
Subproperty of: R65 is realised in (realises)
P130 shows features of (features are also found on)

Quantification: (0:n,0:n)

Scope note: This property identifies an instance of F2 Expression that has been chosen as the most characteristic expression of the instance of F21 Complex Work of which it is an expression.

Typically, any expression that is not regarded as "representative" for the work it expresses, would require a uniform title, with qualifiers specifying the differences between that expression and a representative expression, although this may not always be done. The title of a Work may not be one taken from a representative expression.

A given work can have more than one representative expression, provided the differences between these expressions are not deemed "substantial." If the anticipated needs of users are not considered to call for bibliographic distinctions between variant expressions of a work, then even expressions that differ significantly from each other can be regarded as equally representative for the work. (See *FRBR: Final Report*, p. 19-20).

A given expression can be deemed representative for a work with regard to some of its aspects (e.g., the text contained in an edition the title proper of which reads "The tragicall historie of HAMLET Prince of Denmarke", and the language of that text), and not representative for it with regard to some other aspects (e.g., the title proper "The tragicall historie of HAMLET Prince of Denmarke" itself, which, being different from the title that is regarded as "representative" for Shakespeare's work, will require the use of a uniform title).

R2 has representative expression is a shortcut of the more developed path F1 Work *R33B was assigned by* F37 Representative Expression Assignment *R34 assigned* F2 Expression.

Examples: Walt Whitman's textual work titled "Leaves of Grass" (F21) *R2 has representative expression* the linguistic, English content of the 1892 edition, known as the 'deathbed edition', of Walt Whitman's textual work titled "Leaves of Grass" (F2)

Beethoven's 5th symphony (F21) *R2 has representative expression* the notational content of the 1809 edition of Beethoven's 5th symphony (F2)

Beethoven's 5th symphony (F21) *R2 has representative expression* the sonic content of the recorded performance of Beethoven's 5th symphony by the Berliner Philharmoniker conducted by Herbert von Karajan in Berlin in November 1982 (F2)

The series titled "Nancy Drew Mysteries" (F22) *R2 has representative expression* The overall content provided by publisher named "Armada" in one volume belonging to that series, including, among other elements, the series title page, which states that the title of the series reads "Nancy Drew Mysteries" (F41)

The periodical titled "The New Courier", released by UNESCO, and described by the National Library of France in a bibliographic record that contains the following statement: "Notice réd. d'après le n° d'octobre 2002" (i.e., "description based on the issue dated of October 2002") (F22) *R2 has representative expression* The overall content of the October 2002 issue of UNESCO's periodical titled "The New Courier" (F41)

R3 has representative manifestation product type (is representative manifestation product type for)

Domain: F2 Expression
Range: F3 Manifestation Product Type
Superproperty of: R9 carriers provided by (comprises carriers of)
Quantification: (0:n,0:n)

Scope note: This property identifies an instance of F3 Manifestation Product Type that has been chosen as the most characteristic Manifestation Product Type of the instance of F2 Expression of which it is a manifestation.

Identifying an instance of F3 Manifestation Product Type that is representative for an instance of F2 Expression makes it possible in turn to identify an instance of F2 Expression that is representative for an instance of F1 Work, and to decide what should be regarded as the title of the work.

The title of an Expression may not be one taken from a representative Manifestation Product Type or Manifestation Singleton.

A given expression can have more than one representative manifestation Product type.

R3 has representative manifestation product type is a shortcut of the more developed path F2 Expression *R31B was assigned by* F36 Representative Manifestation Assignment *R32 assigned* F3 Manifestation Product Type.

Examples: The original, English text of Virginia Woolf's textual work titled "Mrs Dalloway" (F20) *R3 has representative manifestation product type* the first edition, dated 1925, of Virginia Woolf's

textual work titled “Mrs Dalloway” (F3)

R5 carries (is carried by)

Domain: F5 Item
Range: F41 Publication Expression
Superproperty of:
Subproperty of: P128 carries (is carried by)

Quantification: (1:1,0:n)

Scope note: This property associates an instance of F5 Item with the unique instance of F41 Publication Expression it carries.
Examples: The British Library’s holding identified by shelfmark “DSC 9078.177 vol 19” (F5) *R5 carries* The entire content (text, layout, publisher logo, etc.) of the publication titled “Functional Requirements for Bibliographic Records: final report”, issued by publisher named “K. G. Saur” in 1998 (F41)

R7 is representative manifestation singleton for (has representative manifestation singleton)

Domain: F4 Manifestation Singleton
Range: F2 Expression
Superproperty of:
Subproperty of: P128 carries (is carried by)

Quantification: (0:n,0:n)

Scope note: This property identifies an instance of Manifestation Singleton that has been declared as the unique representative for an instance of F2 Expression by some bibliographic agency.

This property identifies an instance of F4 Manifestation Singleton that has been chosen as the most characteristic Manifestation Singleton of the instance of F2 Expression of which it is a manifestation.

Identifying an instance of F4 Manifestation Singleton that is representative for an instance of F2 Expression makes it possible in turn to identify an instance of F2 Expression that is representative for an instance of F1 Work, and to decide what should be regarded as the title of the work.

The title of an Expression may not be one taken from a representative Manifestation Product Type or Manifestation Singleton.

A given expression can have more than one representative Manifestation Singleton.

It is a shortcut for the more developed path: F2 Expression *R31B was assigned by* F36 Representative Manifestation Assignment *R53 assigned* F4 Manifestation Singleton.

Examples: The musical text of Stanislas Champein’s opera “Vichnou” (F20) *_R7 has representative manifestation singleton* The manuscript identified by shelfmark “MS-8282” within the collections of the National Library of France, Department for Music (F4) [explanation: the BnF’s Department for Music holds 3 manuscript scores (identified by shelfmarks “MS-8282”, “MS-13778”, and “MS-17321”) for this opera; the title inscribed on MS-8282 is “Vichnou”, while MS-13778 and MS-17321 are titled “Vistnou”; the authorised form chosen by cataloguers and reference tools such as the Grove Dictionary for Opera is “Vichnou”, while “Vistnou” is recorded in the BnF’s authority file only as a cross reference]

R9 carriers provided by (comprises carriers of)

Domain: F2 Expression
Range: F3 Manifestation Product Type
Superproperty of:
Subproperty of: R3 has representative manifestation product type (is representative manifestation product type for)

Quantification: (1:n,0,n)

Scope note: This property associates a publication, i.e. an instance of F3 Manifestation Product Type, with an instance of F2 Expression, which all exemplars of that publication should carry, as long as they are recognised as complete exemplars of that publication. Typically, this property is observed on one exemplar of a publication, and extrapolated to all other exemplars of the same publication. This property is a shortcut of: F3 Manifestation Product Type *CLR5 should carry* F41 Publication Expression *P106 is composed of* F2 Expression.

Examples: Publication identified by ISBN "2-222-00835-2" (F3) *R9 carriers provided by (comprises carriers of)* The text of Marin Mersenne's "Harmonie universelle" (F20)

The CD titled "Musique de la Grèce antique = Ancient Greek music = Griechische Musik der Antike", released in 2000 and identified by UPC/EAN "794881601622" (F3) *R9 carriers provided by (comprises carriers of)* A fragment of Euripides' textual and musical work titled "Orestes" as performed by the Atrium Musicæ Ensemble in Madrid in June 1978 and recorded (F23)

R10 is example of (has example)

Domain: F5 Item
Range: F3 Manifestation Product Type
Superproperty of:
Subproperty of: P2 has type

Quantification: (1:1,0:n)

Scope note: This property identifies the publication to which an instance of F5 Item belongs.

It is a shortcut of the more developed path: F5 Item *R41B was produced by* F40 Carrier Production Event *R39 followed* F39 Production Plan *R37 shows how to realise* F3 Manifestation Product Type.

Examples: The item held by the National Library of France and identified by shelf mark "Res 8 P 10" (F5) *R10 is example of (has example)* The edition of Amerigo Vespucci's textual and cartographic work titled "Mundus novus" issued in Paris ca. 1503-1504 (F3)

R11 is composed of (forms part of)

Domain: F2 Expression
Range: F20 Self-Contained Expression
Superproperty of:
Subproperty of: P106 is composed of (forms part of)

Quantification: (0:n,0:n)

Scope note: This property associates an F2 Expression X with a structural component Y that conveys in itself the complete concept of a work that is member of (R12) the overall work realized by X.

It does not cover the relationship that exists between pre-existing expressions that are re-used in a new, larger expression and that new, larger expression. Such a relationship is modelled by R63 incorporates.

Examples: The Italian text of Dante's textual work titled "Divina Commedia" (F20) *R11 is composed of* The Italian text of Dante's textual work titled "Inferno" (F20)

The musical notation of Mozart's Singspiel titled "Die Zauberflöte" (F20) *R11 is composed of* The musical notation of Mozart's aria titled "Der Hölle Rache", also known as "The Queen of the Night's Aria" (F20)

The visual content of the map titled "Wales – The Midlands – South West England", scale 1:400,000, issued by Michelin in 2005 (F20) *R11 is composed of* The visual content of the inset titled "Liverpool", scale 1:200,000, set within the compass of the map titled "Wales – The Midlands – South West England", scale 1:400,000, issued by Michelin in 2005 (F20)

R12 has member (is member of)

Domain: F21 Complex Work
Range: F1 Work
Superproperty of:
Subproperty of: ????

Quantification: (2:n,0:n)

Scope note: This property associates an instance of F21 Complex Work with an instance of F1 Work that forms part of it. The Work becomes complex by the fact that it has other instances of Work as members.

Examples: Dante's textual work titled "Divina Commedia" (F21) *R12 has member* Dante's textual work titled "Inferno" (F21)

Dante's textual work titled "Inferno" (F21) *R12 has member* The abstract content of the pseudo-old French text of Émile Littré's expression [and individual work] titled "L'Enfer mis en vieux langage françois et en vers" [a 19th century translation of Dante's "Inferno" into old French] published in Paris in 1879 (F46)

Giovanni Battista Piranesi's graphic work titled "Carceri" (F21) [a complex work in 2 senses: it comprises a number of individual engravings, and each engraving is available in more than one state] *R12 has member* Giovanni Battista Piranesi's graphic work titled "Carcere XVI: the pier with chains" (F21)

Giovanni Battista Piranesi's graphic work titled "Carcere XVI: the pier with chains" (F21) [a complex work in 2 senses: it comprises a number of individual engravings, and each engraving is available in more than one state] *R12 has member* The abstract content of Giovanni Battista Piranesi's graphic work titled "Carcere XVI: the pier with chains: 2nd state" (F46)

R13 is realised in (realises)

Domain: F21 ComplexWork
Range: F20 Self-Contained Expression
Subproperty of: R65 is realised in (realises)

Quantification: (0:n,0:n)

Scope note: This property associates a complex work with the self-contained expression of any individual work that is a member of the complex work.

It is a short cut for the more developed paths:

F21 Complex Work *R12 has member* F46 Individual Work *R56 is realised in* F20 Self-Contained Expression
or

F21 Complex Work *R12 has member* F46 Individual Work *R49B was realised through* F31 Expression Creation *R22 created* F20 Self-Contained Expression.

Examples: Abstract content of Giovanni Battista Piranesi's graphic work titled "Carcere XVI: the pier with chains" (F21) *R13 is realised in* Piranesi's graphic work titled "Carcere XVI: the pier with chains: 2nd state" (F20)

Walt Whitman's textual work titled "Leaves of Grass" (F21) *R13 is realised in* the English text of the 1855 edition of Walt Whitman's textual work titled "Leaves of Grass" (F20)

Walt Whitman's textual work titled "Leaves of Grass" (F21) *R13 is realised in* the English text of the 1892 "deathbed" edition of Walt Whitman's textual work titled "Leaves of Grass" (F20)

R15 is fragment of (has fragment)

Domain: F23 Expression Fragment
Range: F2 Expression
Superproperty of:
Subproperty of: P106 is composed of (forms part of)

Quantification: (0:n,0:n)

Scope note: This property associates the fragment of an expression and the expression of which it is a fragment.

Examples: The ancient Greek text of the four stanzas from an ode by Sappho that were quoted by Pseudo-Longinus in his textual work titled "On the sublime" (F23) *R15 is fragment of* The complete ancient Greek text, now irremediably lost, of Sappho's ode currently identified as Sappho's poem #2 (F20)

The statement "fasc. 111" (abridgement for "fascicle no. 111") indicating the sequential position of the publication identified by ISBN "2-7018-0037-4" within the series titled "Bibliothèque des Écoles françaises d'Athènes et de Rome" and identified by ISSN "0257-4101" (F23) *R15 is fragment of* The overall content of the publication identified by ISBN "2-7018-0037-4" (F41)

R16 carried out by (performed)

Domain: F36 Representative Manifestation Assignment
Range: F28 Bibliographic Agency
Superproperty of:
Subproperty of: P14 carried out by (performed)

Quantification: (1:1,0:n)

Scope note: This property associates a bibliographic agency (represented by one or more of its cataloguers) and the assigning of which Manifestation (i.e., which instance of F3 Manifestation Product Type or F4 Manifestation Singleton) is representative for a given expression.

In cataloguing practice, such a relationship is usually just implicit. However, it can become explicit, for example when a bibliographic agency creates an authority record for a given work and fills the "Source" field with information about the publication that contains the expression that was used by the bibliographic agency to establish the uniform title for the work realised in that expression.

Examples: Assigning the manuscript identified by shelfmark "MS-8282" within the collections of the National Library of France, Department for Music, as representative for the musical text of Stanislas Champein's opera "Vichnou" (F36) *R16 carried out by* The National Library of France, identified by code "FRBNF" at the beginning of field 001 in the INTERMARC

authority record for the author/title heading for Stanislas Champein's opera "Vichnou" (F28)

The assignment of the book that was published at some time between 1991 and 2004 and the title proper of which reads "The astādhyāyī of Pānini with translation and explanatory notes" as being a representative instance of F3 Manifestation Product Type for texts that constitute bilingual editions in Sanskrit and English of Pānini's "Astādhyāyī" (F36) *R16 carried out by* The bibliographic agency identified, in field 040 of a MARC21 authority record for the author/title heading "Pānini. Astādhyāyī. English & Sanskrit", by the code "DLC" (i.e., the Library of Congress) (F28)

R17 carried out by (performed)

Domain: F37 Representative Expression Assignment
Range: F28 Bibliographic Agency
Superproperty of:
Subproperty of: P14 carried out by (performed)

Quantification: (1:1,0:n)

Scope note: This property associates a bibliographic agency (represented by one or more of its cataloguers) and the assigning of which expression is representative for a given Work.

In cataloguing practice, such a relationship is usually just implicit. However, it can become explicit, for example when a bibliographic agency creates an authority record for a given work and fills the "Source" field with information about the publication that contains the expression that was used by the bibliographic agency to establish the uniform title for the work realised in that expression.

Examples: Assigning the musical text contained in the manuscript identified by shelfmark "MS-8282" within the collections of the National Library of France, Department for Music, as representative for Stanislas Champein's opera "Vichnou" (F36) *R17 carried out by* The National Library of France, identified by code "FRBNF" at the beginning of field 001 in the INTERMARC authority record for the author/title heading for Stanislas Champein's opera "Vichnou" (F28)

The assignment of the Sanskrit text contained in the book that was published in 1973 under the title "Pāṇinīyaṃ Sabdānuśāsanam" as being a representative instance of F2 Expression for the textual work of Pānini titled "Astādhyāyī" (F37) *R17 carried out by* The bibliographic agency identified, in field 040 of a MARC21 authority record for the author/title heading "Pānini. Astādhyāyī", by the code "DLC" (i.e., the Library of Congress) (F28)

R21 initiated (was initiated by)

Domain: F30 Work Conception
Range: F1 Work
Superproperty of:
Subproperty of: P94 created (was created by)

Quantification: (0:1,1:n)

Scope note: This property associates the first conception of a work and the work itself that ensued from a given initial idea.

It is usually not recorded in cataloguing practice as it is only exceptionally documented in real life but is required in this semantic model as it marks the origin of the causality chain that results in a work's coming into existence.

Examples: The creative spark that motivated Richard Wagner, during a stormy sea crossing in

July/August 1839, to compose an opera (F30) *R21 initiated* Richard Wagner's opera titled "Der fliegende Holländer" (F21)

The creative spark that motivated Oscar Wilde, by May 1897, to write a poem inspired by his stay in the Reading prison in 1895-1897 (F30) *R21 initiated* Oscar Wilde's poem titled "The ballad of the Reading gaol" (F21)

R22 created (was created by)

Domain: F31 Expression Creation
Range: F2 Expression
Superproperty of: R67 created (was created by)
Subproperty of: P94 created (was created by)

Quantification: (1:1,1:n)

Scope note: This property identifies the expression that was first externalised during a particular creation event.

Examples: Richard Wagner's writing the original manuscript of his opera titled "Der fliegende Holländer" (F31) *R22 created* the notational content of the original manuscript of Richard Wagner's opera titled "Der fliegende Holländer" (F20)

Oscar Wilde's writing the original manuscript of his poem titled "The ballad of the Reading gaol" (F31) *R22 created* the English text of Oscar Wilde's poem titled "The ballad of the Reading gaol" (F20)

R24 assigned to (was assigned by)

Domain: F33 Identifier Assignment
Range: E1 CRM Entity
Superproperty of: P36 registered (was registered by)
Subproperty of: P140 assigned attribute to (was attributed by)

Quantification: (1:1,0:n)

Scope note: This property identifies the entity to which an actor, such as a bibliographic agency, assigned an instance of F14 Identifier.

Examples: Assigning the uniform title "The Adoration of the Shepherds (Coventry)" (F33) *R24 assigned to* The anonymous textual work otherwise simply known as "The Adoration of the Shepherds" (F21) [assignment of an Identifier to a Work]

Assigning the uniform title "Rite of spring (Choreographic Work : Bausch)" (F33) *R24 assigned to* Pina Bausch's choreographic work initially simply titled "Rite of spring" (F21) [assignment of an Identifier to a Work]

Assigning the uniform title "King Kong (1933)" (F33) *R24 assigned to* The motion picture directed in 1933 by Merian C. Cooper and Ernest B. Schoedsack and simply titled "King Kong" (F21) [assignment of an Identifier to a Work]

Assigning the personal name heading "Guillaume, de Machaut, ca. 1300-1377" (F33) *R24 assigned to* Guillaume de Machaut (F8) [assignment of an Identifier to a Person]

Assigning the corporate name heading "Univerza v Ljubljani. Oddelek za bibliotekarstvo" (F33) *R24 assigned to* The Department for library science of the University of Ljubljana (F7) [assignment of an Identifier to a Corporate Body]

R25 assigned (was assigned by)

Domain: F33 Identifier Assignement
Range: F14 Identifier
Superproperty of: P37 assigned (was assigned by)
Subproperty of: P141 assigned (was assigned by)

Quantification: (1:1,0:n)

Scope note: This property associates the instance of F14 Identifier assigned to an instance of E1 CRM Entity and the event of assigning it.

Examples: Assigning a uniform title to the anonymous textual work known as "The Adoration of the Shepherds", a title shared by another, distinct anonymous textual work (F33) *R25 assigned* Uniform title "The Adoration of the Shepherds (Coventry)" (F14)

Assigning a uniform title to Pina Bausch's choreographic work initially simply titled "Rite of spring" (F33) *R25 assigned* Uniform title "Rite of spring (Choreographic Work : Bausch)" (F14)

Assigning a uniform title to the motion picture directed in 1933 by Merian C. Cooper and Ernest B. Schoedsack and titled "King Kong" (F33) *R25 assigned* Uniform title "King Kong (1933)" (F14)

Assigning a personal name heading to Guillaume de Machaut (F33) *R25 assigned* "Guillaume, de Machaut, ca. 1300-1377" (F14)

Assigning a corporate name heading to The Department for library science of the University of Ljubljana (F33) *R25 assigned* "Univerza v Ljubljani. Oddelek za bibliotekarstvo" (F14)

Assigning a subject heading (in an authority record) to the concept of knowledge representation (F33) *R25 assigned* "Conceptual structures (Information theory)" (F14)

Assigning a subject heading (in a bibliographic record) to the concept of the appreciation of Victor Hugo's works in Germany between 1870 and 1914 (F33) *R25 assigned* "Hugo, Victor, 1802-1885 – Appreciation – Germany – 1870-1914" (F14)

R26 used constituent (was used in)

Domain: F33 Identifier Assignment
Range: F13 Name
Superproperty of:
Subproperty of: P16 used object

Quantification: (0:n,0:n)

Scope note: This property associates the event of assigning an instance of F14 Identifier to an entity with the elements that an actor used to compose that identifier.

Examples: Assigning a uniform title to the anonymous textual work known as "The Adoration of the Shepherds", a title shared by another, distinct anonymous textual work (F33) *R26 used constituent* "Coventry" (E48 Place Name – i.e., the name of an F12 Place)

Assigning a uniform title to Pina Bausch's choreographic work initially simply titled "Rite of spring" (F33) *R26 used constituent* "(Choreographic Work : Bausch)" (F13), which is itself composed of "Choreographic Work" (F13 Name for an E55 Type), and "Bausch" (F13 Name for an F8 Person)

Assigning a uniform title to the motion picture directed in 1933 by Merian C. Cooper and Ernest B. Schoedsack and titled "King Kong" (F33) *R26 used constituent* "1933" (E50 Date, subclass of E41 Appellation)

Assigning the personal name heading "Guillaume, de Machaut, ca. 1300-1377" to Guillaume

de Machaut (F33) *R26 used constituent* “Guillaume, de Machaut” (F13 Name for an F8 Person), and “ca. 1300-1377” (E49 Time Apellation for an E52 Time-Span [P79 beginning is qualified by E62 String “ca.”])

Assigning the corporate name heading “Univerza v Ljubljani. Oddelek za bibliotekarstvo” to The Department for library science of the University of Ljubljana (F33) *R26 used constituent* “Univerza v Ljubljani” (F14 Identifier for an F7 Corporate Body), and “Oddelek za bibliotekarstvo” (F14 Identifier for an F7 Corporate Body)

R31 assigned to (was assigned by)

Domain: F36 Representative Manifestation Assignment
Range: F2 Expression
Superproperty of:
Subproperty of: P140 assigned attribute to (was attributed by)

Quantification: (1:1,0:n)

Scope note: This property associates the event of assigning a representative instance of F3 Manifestation Product Type or F4 Manifestation Singleton with the expression to which it was assigned.

Examples: Assigning the manuscript held by the National Library of France and identified by shelf mark “MS-8282” as a representative Manifestation Singleton (F36) *R31 assigned to* The musical text of Stanislas Champein’s opera “Vichnou” (F20)

R32 assigned (was assigned by)

Domain: F36 Representative Manifestation Assignment
Range: F3 Manifestation Product Type
Superproperty of:
Subproperty of: P141 assigned (was assigned by)

Quantification: (0:n,0:n)

Scope note: This property associates the event of assigning a representative instance of F3 Manifestation Product Type with the F3 Manifestation Product Type which has been assigned.

Examples: Assigning a representative manifestation for the English text of Virginia Woolf’s novel titled “The hours” on the original manuscript and “Mrs Dalloway” on the first printed edition (F36) *R32 assigned* The first printed edition, titled “Mrs Dalloway” (F3)

R33 assigned to (was assigned by)

Domain: F37 Representative Expression Assignment
Range: F21 Complex Work
Superproperty of:
Subproperty of: P140 assigned attribute to (was attributed by)

Quantification: (1:1,0:n)

Scope note: This property associates the event of assigning a representative instance of F2 Expression with the instance of F21 Complex Work to which it was assigned.

Examples: Assigning the English text titled “Murders in the rue Morgue”, with that particular formulation of its title, as a representative expression (F37) *R33 assigned to* Edgar Allan Poe’s textual work known, accordingly, as “Murders in the rue Morgue” (F21)

Assigning the Sanskrit text titled “Astādhyāyī”, with that particular formulation of its title, as a representative expression (F37) *R33 assigned to* Pānini’s textual work known, accordingly, as “Astādhyāyī” (F21)

R34 assigned (was assigned by)

Domain: F37 Representative Expression Assignment
Range: F2 Expression
Superproperty of:
Subproperty of: P141 assigned (was assigned by)

Quantification: (1:n,0:n)

Scope note: This property associates the event of assigning a representative instance of F2 Expression with the F2 Expression which has been assigned.

Examples: Assigning a representative expression to Edgar Allan Poe’s textual work known as “Murders in the rue Morgue” in English or “Double meurtre dans la rue Morgue” in French (F37) *R34 assigned* The English text titled, in English, “Murders in the rue Morgue”, with that particular formulation of its title (F20)

Assigning a representative, although fragmentary, expression to Sappho’s ode referred to as Sappho’s Poem #2 (F37) *R34 assigned* The ancient Greek text of four stanzas quoted in the treatise titled “On the sublime” attributed to an unknown author referred to as “Pseudo-Longinus” (F23)

R37 shows how to realise (is realised using)

Domain: F39 Production Plan
Range: F3 Manifestation Product Type
Superproperty of:
Subproperty of: NO EQUIVALENT

Quantification: (0:1,0:1)

Scope note: This property associates an instance of F39 Production Plan for producing instances of F5 Item, with the instance of F3 Manifestation Product Type such items should belong to.

Examples: The set of instructions at the origin of the production of copies of the publication titled “Codex Manesse: die Miniaturen der großen Heidelberger Liederhandschrift, herausgegeben und erläutert von Ingo F. Walther unter Mitarbeit von Gisela Siebert”, 3rd edition, Insel-Verlag, 1988 (F39) *R37 shows how to realise* The publication identified as “Codex Manesse: die Miniaturen der großen Heidelberger Liederhandschrift, herausgegeben und erläutert von Ingo F. Walther unter Mitarbeit von Gisela Siebert”, 3rd edition, Insel-Verlag, 1988 (F3)

The set of instructions at the origin of the production of copies of the publication titled “Ordnance Survey Explorer Map 213, Aberystwyth & Cwm Rheidol”, ISBN 0-319-23640-4 (folded), 1:25,000 scale, released in May 2005 (F39) *R37 shows how to realise* The publication identified by ISBN “0-319-23640-4” (F3)

The set of instructions at the origin of the production of copies of the sound recording titled “The Glory (????) of the human voice”, RCA Victor Gold Seal GD61175, containing recordings of musical works performed by Florence Foster Jenkins (F39) *R37 shows how to realise* The publication identified by the title proper “The Glory (????) of the human voice” and the label and label number “RCA Victor Gold Seal GD61175” (F3)

The set of instructions (dated of 1972) at the origin of the production of a second run print of copies (in 1978) of the publication titled “The complete poems of Stephen Crane, edited with an introduction by Joseph Katz” (ISBN “0-8014-9130-4”) (F39) *R37 shows how to realise* The

publication titled “The complete poems of Stephen Crane, edited with an introduction by Joseph Katz” (identified by ISBN “0-8014-9130-4”) (F3)

R38 produced things of type (was produced by)

Domain: F40 Carrier Production Event
Range: F3 Manifestation Product Type
Superproperty of:
Subproperty of: NO EQUIVALENT (indirect expression possible)

Quantification: (1:n,0:n)

Scope note: This property associates an instance of F40 Carrier Production Event with the instance of F3 Manifestation Product Type it produced items of.

Examples: The production of copies of the publication titled “Codex Manesse: die Miniaturen der großen Heidelberger Liederhandschrift, herausgegeben und erläutert von Ingo F. Walther unter Mitarbeit von Gisela Siebert”, 3rd edition, Insel-Verlag, 1988 (F40) *R38 produced things of type* The publication identified as “Codex Manesse: die Miniaturen der großen Heidelberger Liederhandschrift, herausgegeben und erläutert von Ingo F. Walther unter Mitarbeit von Gisela Siebert”, 3rd edition, Insel-Verlag, 1988 (F3)

The production of copies of the publication titled “Ordnance Survey Explorer Map 213, Aberystwyth & Cwm Rheidol”, ISBN 0-319-23640-4 (folded), 1:25,000 scale, released in May 2005 (F40) *R38 produced things of type* The publication identified by ISBN “0-319-23640-4” (F3)

The production of copies of the sound recording titled “The Glory (????) of the human voice”, RCA Victor Gold Seal GD61175, containing recordings of musical works performed by Florence Foster Jenkins (F40) *R38 produced things of type* The publication identified by the title proper “The Glory (????) of the human voice” and the label and label number “RCA Victor Gold Seal GD61175” (F3)

The production of a second print run, in 1978, of the publication titled “The complete poems of Stephen Crane, edited with an introduction by Joseph Katz” (identified by ISBN “0-8014-9130-4”) (F40) *R38 produced things of type* The publication, dated 1972, titled “The complete poems of Stephen Crane, edited with an introduction by Joseph Katz” (identified by ISBN “0-8014-9130-4”) (F3)

R39 followed (was followed by)

Domain: F40 Carrier Production Event
Range: F39 Production Plan
Superproperty of:
Subproperty of: P33 used specific technique (was used by)

Quantification: (0:n,0:n)

Scope note: This property associates an instance of F40 Carrier Production Event with the set of instructions (i.e., the instance of F39 Production Plan) on which this production process was based.

Examples: The production of copies of the publication titled “Codex Manesse: die Miniaturen der großen Heidelberger Liederhandschrift, herausgegeben und erläutert von Ingo F. Walther unter Mitarbeit von Gisela Siebert”, 3rd edition, Insel-Verlag, 1988 (F40) *R39 followed* The set of instructions for the publication titled “Codex Manesse: die Miniaturen der großen Heidelberger Liederhandschrift, herausgegeben und erläutert von Ingo F. Walther unter Mitarbeit von Gisela Siebert”, 3rd edition, Insel-Verlag, 1988 (F39)

The production of copies of the publication titled “Ordnance Survey Explorer Map 213, Aberystwyth & Cwm Rheidol”, ISBN 0-319-23640-4 (folded), 1:25,000 scale, released in May 2005 (F40) *R39 followed* The set of instructions for the publication titled “Ordnance Survey Explorer Map 213, Aberystwyth & Cwm Rheidol”, ISBN 0-319-23640-4 (folded), 1:25,000 scale, released in May 2005 (F39)

The production of copies of the sound recording titled “The Glory (????) of the human voice”, RCA Victor Gold Seal GD61175, containing recordings of musical works performed by Florence Foster Jenkins (F40) *R39 followed* The set of instructions for the sound recording titled “The Glory (????) of the human voice”, RCA Victor Gold Seal GD61175, containing recordings of musical works performed by Florence Foster Jenkins (F39)

The second print run, in 1978, of the publication titled “The complete poems of Stephen Crane, edited with an introduction by Joseph Katz” (ISBN “0-8014-9130-4”) (F40) *R39 followed* The set of instructions for the publication titled “The complete poems of Stephen Crane, edited with an introduction by Joseph Katz” (ISBN “0-8014-9130-4”), a publication dated of 1972 (F39)

R40 used as source material (was used by)

Domain: F40 Carrier Production Event
Range: F41 Publication Expression

Superproperty of:
Subproperty of: P16 used specific object (was used for)

Quantification: (0:n,0:n)

Scope note: This property associates an instance of F40 Carrier Production Event with instances of E41 Publication Expression that carry all or part of the expression embodied in the produced items.

Examples: The production of copies of the publication identified by ISBN “1-86197-612-7” (F40) *R40 used as source material* The final set of signs sent by the publisher named “Profile Books” to its printer for the production of copies of the publication identified by ISBN “1-86197-612-7” (F41)

R41 produced (was produced by)

Domain: F40 Carrier Production Event
Range: F5 Item
Superproperty of:
Subproperty of: P108 produced (was produced by)

Quantification: (0:n,1:1)

Scope note: This property associates an instance of F40 Carrier Production Event with any one of the produced items (i.e., the instances of F5 Item).

Examples: The production of copies of the the publication titled “Codex Manesse: die Miniaturen der großen Heidelberger Liederhandschrift, herausgegeben und erläutert von Ingo F. Walther unter Mitarbeit von Gisela Siebert”, 3rd edition, Insel-Verlag, 1988 (F40) *R41 produced* The National Library of France’s holding identified by shelf mark “C-1604(2)” (F5)

The production of copies of the the publication titled “Ordnance Survey Explorer Map 213, Aberystwyth & Cwm Rheidol”, ISBN 0-319-23640-4 (folded), 1:25,000 scale, released in May 2005 (F40) *R41 produced* The National Library of Wales’ holding identified by holding information “MAP, STORFA/STACK ; FLAT MAP, C16 (20/1), Sheet 213, c.135/5/2” (F5)

The production of copies of the sound recording titled “The Glory (????) of the human voice”, RCA Victor Gold Seal GD61175, containing recordings of musical works performed by

Florence Foster Jenkins (F40) *R41 produced* The London Public Library's holding identified by call number "R J416.Gl" (F5)

The second print run, occurring in 1978, of the publication dated of 1972 and titled "The complete poems of Stephen Crane, edited with an introduction by Joseph Katz" (identified by ISBN "0-8014-9130-4") (F40) *R41 produced* Universitätsbibliothek Passau's holding identified by call number "00/HT 4801.978 K2" (F5)

R45 created (was created by)

Domain: F31 Expression Creation
Range: F4 Manifestation Singleton
Superproperty of:
Subproperty of: P108 produced (was produced by)

Quantification: (1:n,0:1)

Scope note: This property associates an instance of F31 Expression Creation with the first physical objects in which the resulting instance of F2 Expression was embodied.

Examples: Emily Dickinson's creating the text of one of the several extant versions of her poem known as "Safe in their alabaster chambers" (F31) *R45 created* The manuscript now identified as "Massachusetts Cambridge Harvard University Houghton Library bMS Am 1118.3 (203c, 203d)" (F4)

Emily Dickinson's creating the text of another one of the several extant versions of her poem known as "Safe in their alabaster chambers" (F31) *R45 created* The manuscript now identified as "Massachusetts Cambridge Harvard University Houghton Library bMS Am 1118.5 (74c)" (F4)

The recording of the third alternate take of the musical work titled "Blue Hawaii" performed by Elvis Presley in Hollywood, Calif., Radio Recorders, on March 22nd, 1961 (F31) *R45 created* The master tape of the 3rd alternate take of the musical work titled "Blue Hawaii" performed by Elvis Presley in Hollywood, Calif., Radio Recorders, on March 22nd, 1961 (F4) (each individual take is a distinct expression)

The resource (a drawing) held by the New York Public Library and identified by call number "*MGZGB Far P Cop 1" (F4) *R45B was created by* The creation, by the artist named "Peter Farmer", of a costume design for the character named "War" in the Act III Masque of the seasons, in the Festival Ballet of London production of the choreographic work titled "Coppélia", with choreography by Jack Carter after Petipa (F31)

R49 created a realisation of (was realised through)

Domain: F31 Expression Creation
Range: F1 Work
Superproperty of:
Subproperty of: P16 used specific object (was used for)

Quantification: (1:n,1:1)

Scope note: This property associates an instance of F31 Expression Creation with the corresponding instance of F46 Individual Work or an instance of F21 Complex Work of which the corresponding instance of F46 Individual Work is a member.

Examples: Giovanni Battista Piranesi's creating the image identified as "Carcere XVI: the pier with chains: 2nd state" (F31) *R49 created a realisation of* The concept of Giovanni Battista Piranesi's graphic work titled "Carcere XVI: the pier with chains: 2nd state" (F46)

Recording Glenn Gould's performance of Johann Sebastian Bach's musical work titled "Toccata in C minor BWV 911" on May 15 & 16, 1979, in Toronto, Eaton's Auditorium (F31) *R49 created a realisation of* The concept of the recorded performance of Johann Sebastian Bach's musical work titled "Toccata in C minor BWV 911" by Glenn Gould on May 15 & 16, 1979, in Toronto, Eaton's Auditorium (F46)

R51 consists of (forms part of)

Domain: F14 Identifier
Range: F13 Name
Superproperty of:
Subproperty of:

Quantification: (0:n,0:n)

Scope note: This property associates an instance of F14 Identifier with any one of the meaningful parts it is composed of, which are themselves instances of F13 Name. In particular, date expressions (i.e. instances of E50 Date) are regarded as names.

Examples: Uniform title "The Adoration of the Shepherds (Coventry)" (F14) *R51 consists of* "The Adoration of the Shepherds" (E35 Title), and "Coventry" (E48 Place Name – i.e., the name of an F12 Place)

Uniform title "Rite of spring (Choreographic Work : Bausch)" (F14) *R51 consists of* "Rite of spring" (E35 Title), "Choreographic Work" (F13 Name for an E55 Type), and "Bausch" (F13 Name for an F8 Person)

Uniform title "King Kong (1933)" (F14) *R51 consists of* "King Kong" (E35 Title), and "1933" (E50 Date, subclass of E41 Appellation)

Personal name heading "Guillaume, de Machaut, ca. 1300-1377" (F14 Identifier for an F8 Person) *R51 consists of* "Guillaume, de Machaut" (F13 Name for an F8 Person), and "ca. 1300-1377" (E49 Time Apellation for an E52 Time-Span [P79 beginning is qualified by E62 String "ca."])

Corporate name heading "Univerza v Ljubljani. Oddelek za bibliotekarstvo" (F14 Identifier for a F7 Corporate Body) *R51 consists of* "Univerza v Ljubljani" (F14 Identifier for a F7 Corporate Body), and "Oddelek za bibliotekarstvo" (F13 Name for a F7 Corporate Body)

ISBN "978-002-002-0" (F47) *R51 consists of* Prefix "978" for the Nigerian ISBN Agency (F13 Name for a F7 Corporate Body), and *R51 consists of* code "002" for the Nigerian Institute of International Affairs (F13 Name for a F7 Corporate Body), and *R51 consists of* code "002" for the publication titled "Nigeria's international economic relations" (F13 Name for a F3 Manifestation Product Type)

R52 used rule (was the rule used in)

Domain: F33 Identifier Assignment
Range: F16 Identifier Rule
Superproperty of:
Subproperty of: P33 used specific technique[5]

Quantification: (0:n,0:n)

Scope note: This property associates the event of assigning an instance of F14 Identifier with the instructions followed by an actor, such as a Bibliographic Agency, in creating that identifier.

[5] compatible with next CRM version

Examples: Assigning the uniform title “Bach, Johann Sebastian, 1685-1750. Concertos, violins (2), string orchestra, BWV 1043, D minor” to Johann Sebastian Bach’s Double Concerto in D minor, BWV 1043 (F33) *R52 used rule* AACR2R 25.25-25.35F1 (F16)

Assigning the uniform title “Bach, Johann Sebastian [Konzerte, Vl 1 2 Orch BWV 1043]” to Johann Sebastian Bach’s Double Concerto in D minor, BWV 1043 (F33) *R52 used rule* RAK-Musik (Revidierte Ausgabe 2003), Chapter 6 (F16)

Assigning the uniform title “Bach, Johann Sebastian (1685-1750). – [Concertos. Violons (2), orchestre à cordes. BWV 1043. Ré mineur]” to Johann Sebastian Bach’s Double Concerto in D minor, BWV 1043 (F33) *R52 used rule* AFNOR Z 44-079 (F16)

Assigning the personal name heading “Guillaume de Machaut (1300?-1377)” (F33) *R52 used rule* AFNOR Z 44-061 (F16)

Assigning the personal name heading “Guillaume, de Machaut, ca. 1300-1377” (F33) *R52 used rule* AACR2R 22 (F16)

R53 assigned (was assigned by)

Domain: F36 Representative Manifestation Assignment
Range: F4 Manifestation Singleton
Superproperty of:
Subproperty of: P141 assigned (was assigned by)

Quantification: (0:n,0:n)

Scope note: This property associates the event of assigning a representative instance of F4 Manifestation Singleton with the F4 Manifestation Singleton which has been assigned.

Examples: Assigning a representative manifestation to the musical text of Stanislas Champein’s opera “Vichnou” (F36) *R53 assigned* The manuscript identified by shelfmark “MS-8282” within the collections of the National Library of France, Department for Music [explanation: the BnF’s Department for Music holds 3 manuscript scores (identified by shelfmarks “MS-8282”, “MS-13778”, and “MS-17321”) for this opera; the title inscribed on MS-8282 is “Vichnou”, while MS-13778 and MS-17321 are titled “Vistnou”; the authorised form chosen by cataloguers and reference tools such as the Grove Dictionary for Opera is “Vichnou”, while “Vistnou” is recorded in the BnF’s authority file only as a cross reference]

R55 created (was created by)

Domain: F45 Publication Event
Range: F39 Production Plan
Superproperty of:
Subproperty of: P94 created (was created by)

Quantification: (0:1,1:1)

Scope note: This property associates the event of publishing with the instance of F39 Production Plan intended to be used to produce the published items.

Examples: Publishing Amerigo Vespucci’s textual and cartographic work titled “Mundus novus” in Paris ca. 1503-1504 (F45) *R55 created production plan* The set of instructions for the production of copies of Amerigo Vespucci’s textual and cartographic work titled “Mundus novus” (F39)

Establishing in 1972 the layout, features, and prototype for the production of the publication titled “The complete poems of Stephen Crane, edited with an introduction by Joseph Katz” (ISBN “0-8014-9130-4”), which served for a second print run in 1978 (F45) *R55 created production plan* The set of instructions (dated 1972 and reused in 1978 for a second print run)

for the production of copies of the publication titled “The complete poems of Stephen Crane, edited with an introduction by Joseph Katz” (ISBN “0-8014-9130-4”) (F39)

R56 is realised in (realises)

Domain: F46 Individual Work
Range: F20 Self-Contained Expression

Subproperty of: R65 is realised in (realises)

Quantification: (1:1,1:1)

Scope note: This property associates an F46 Individual Work and its F20 Self-Contained Expression that completely conveys it.

It is a short cut for the more developed path: F46 Individual Work *R49B was realised through* F31 Expression Creation *R22 created* F20 Self-Contained Expression.

Examples: Abstract content of Giovanni Battista Piranesi’s graphic work titled “Carcere XVI: the pier with chains: 2nd state” (F46) *R56 is realised in* Giovanni Battista Piranesi’s graphic work titled “Carcere XVI: the pier with chains: 2nd state” (F20)

Abstract content of the English text of the 1855 edition of Walt Whitman’s textual work titled “Leaves of Grass” (F46) *R56 is realised in* the English text of the 1855 edition of Walt Whitman’s textual work titled “Leaves of Grass” (F20)

R57 is logical successor of (has successor)

Domain: F1 Work
Range: F1 Work
Superproperty of:
Subproperty of: P130 shows features of (features are also found on)

Quantification: (0:n,0:n)

Scope note: This property associates an instance of F1 Work which logically continues the content of another instance of F1 Work with the latter.

Examples: The novel titled “H.-- : the story of Heathcliff’s journey back to Wuthering Heights”, authored by the person named “Lin Haire-Sargeant” (F1) *R57 is logical successor of* The novel titled “Wuthering Heights”, authored by the person named “Emily Brontë” (F1)

The first “Star wars” trilogy (1977-1983) *R57 is logical successor of* The second “Star wars” trilogy (1999-2005) *[Note that the* logical *order does not follow, in this case, the* chronological *order]*

R58 is derivative of (has derivative)

Domain: F1 Work
Range: F1 Work
Superproperty of:
Subproperty of: P130 shows features of (features are also found on)

Quantification: (0:n,0:n)

Scope note: This property associates an instance of F1 Work which modifies the content of another instance of F1 Work with the latter. The property *R58.1 has type* of this property allows for specifying the kind of derivation, such as adaptation, summarization etc.

Examples: William Schuman's orchestration of Charles Ives's "Variations on America" (F21) *R58 is derivative of* Charles Ives's "Variations on America" (F21) *R58.1 has type* "orchestration" (E55)

Charles Ives's musical work titled "Variations on America" (F21) *R58 is derivative of* The musical work titled "America" (F21) *R58.1 has type* "variations" (E55)

The musical work titled "America" (F21) *R58 is derivative of* The musical work titled "God save the King" (F21) *R58.1 has type* "same tune with different lyrics" (E55)

Properties: R58.1 has type: E55 Type

R59 reproduced (was reproduced by)

Domain: F44 Reproduction Event
Range: E84 Information Carrier
Superproperty of:
Subproperty of: P16 used specific object (was used for)

Quantification: (1:n,0:n)

Scope note: This property associates an instance of F44 Reproduction Event with an instance of E84 Information Carrier it reproduces.

Examples: Making a photocopy of an exemplar of Eran Guter's dissertation titled "Where languages end : Ludwig Wittgenstein at the crossroads of music, language, and the world" (F44) *R59 reproduced* One of the original exemplars of Eran Guter's dissertation (E84)

R60 produced (was produced by)

Domain: F44 Reproduction Event
Range: E84 Information Carrier
Superproperty of:
Subproperty of: P108 has produced (was produced by)

Quantification: (1:n,0:1)

Scope note: This property associates an instance of F44 Reproduction Event with an instance of E84 Information Carrier it produces.

Examples: Making a photocopy of an exemplar of Eran Guter's dissertation titled "Where languages end : Ludwig Wittgenstein at the crossroads of music, language, and the world" (F44) *R60 produced* The New York Public Library holding identified by call number "JMD 04-1060" (E84)

R61 is reproduction of (has reproduction)

Domain: E84 Information Carrier
Range: E84 Information Carrier
Superproperty of:
Subproperty of: P130 shows features of (features are also found on)

Quantification: (0:1,0:n)

Scope note: This property associates an instance of E84 Information Carrier which is a reproduction of another instance of E84 Information Carrier with the latter. It is considered that a reproduction of multiple originals resulting in a single product requires a merging of those objects prior to the reproduction. Therefore an Information Carrier is regarded to be a reproduction of one and only one original.

Examples: The New York Public Library holding identified by call number "JMD 04-1060" (E84) *R61 is reproduction of* One of the original exemplars of Eran Guter's dissertation (E84)

R62 has issuing rule (is issuing rule of)

Domain: F22 Serial Work
Range: E29 Design or Procedure
Superproperty of:
Subproperty of: SHORTCUT OF....

Quantification: (0:n,0:n)

Scope note: This property associates an instance of F22 Serial Work with the instance of E29 Design or Procedure that specifies the issuing policy planned by this Work, such as sequencing pattern, expected frequency and expected regularity.

Examples: The serial titled "Quarterly journal of pure and applied mathematics", identified by ISSN "1549-6724" (F22) *R62 has issuing rule* To be issued every three months, on a regular basis, with each issue being numbered according to the pattern "Vol. 1, no. 1 (2005)" that was observed by the Library of Congress's cataloguers on an exemplar of the first issue (E29)

R63 incorporates (is incorporated in)

Domain: F20 Self-Contained Expression
Range: F2 Expression
Superproperty of:
Subproperty of: P106 is composed of (forms part of)

Quantification: (0:n,0:n)

Scope note: This property associates an instance of F20 Self-Contained Expression with an instance of F2 Expression that was included in it and that is a realization of an independent work. The incorporated expression may be self-contained or fragmentary.

This property makes it possible to recognise the autonomous status of the incorporated expression, which was created in a distinct context, and can be incorporated in many distinct self-contained expressions, and to highlight the difference between "structural" and "accidental" whole-part relationships between conceptual entities.

It accounts for many cultural facts that are quite frequent and significant but often inadequately dealt with in documentation practice: the inclusion of a poem in an anthology, the re-use of an operatic aria in a new opera, the use of a reproduction of a painting for a book cover or a CD booklet, the integration of textual quotations, the presence of lyrics in a song that sets those lyrics to music, the presence of the text of a play in a movie based on that play, etc.

Examples: The text of version 0.8 of the $FRBR_{OO}$ definition (F20) *R63 incorporates* phrases of the text of version 4.2 of the CIDOC CRM definition (F23)

The text of the anthology titled "American Women Poets of the Nineteenth Century: An Anthology", edited by Cheryl Walker and published by Rutgers University Press in July 1992 (F20) *R63 incorporates* The text of the poem titled "Acquainted with Grief" and authored by Helen Hunt Jackson

The sonic content of the CD titled “Great moments of Lucia Popp” issued by EMI Music International in 1996 and identified by UPC/EAN “0724356577022” (F41) *R63 incorporates* The recorded performance of Mozart’s aria titled “Der Hölle Rache” (also known as “The Queen of the Night’s Aria”) by Lucia Popp accompanied by the Philharmonia orchestra conducted by Otto Klemperer in London, Kingsway Hall, between March 24, 1964 and April 10, 1964 (F56)

The set of instructions for the production of *King Lear*, directed by Sergei Radlov in Moscow in 1935 (F50) *R63 incorporates* The Yiddish text of *King Lear* as translated by Shmuel Galkin (F20)

The set of instructions for the production of *King Lear*, directed by Sergei Radlov in Moscow in 1935 (F50) *R63 incorporates* The musical content of the score of the incidental music composed by Lev Pulver (F20)

The set of instructions for the production of *King Lear*, directed by Sergei Radlov in Moscow in 1935 (F50) *R63 incorporates* The visual items (E36) shown in Alexander Tyschler’s scene settings and the models built by him for these settings (F20 and E36)

The set of instructions for the production of the ballet *Rite of spring*, as choreographed by Pina Bausch in Wuppertal in 1975 (F50) *R63 incorporates* The musical score of Igor Stravinsky’s musical work *Rite of spring* (F20)

R64 performed (was performed in)

Domain: F52 Performance
Range: F50 Performance Plan
Superproperty of:
Subproperty of: P33

Quantification: (0:n,0:n)

Scope note: This property associates an instance of F52 Performance with the instance of F50 Performance Plan to which all those participating in the performance were supposed to conform.

Examples: Performing the first performance of a Yiddish translation of *King Lear*, as directed by Sergei Radlov, in Moscow, at the Moscow State Jewish Theatre, on February 10, 1935 (F52) *R64 performed* the set of instructions for the production of a Yiddish translation of *King Lear*, directed by Sergei Radlov in Moscow in 1935 (F50 Performance Plan)

Performing the ballet *Rite of spring*, as choreographed by Pina Bausch, in Avignon, at the Popes’ Palace, on July 7, 1995 (F52) *R64 performed* the set of instructions for the production of the ballet *Rite of spring*, as choreographed by Pina Bausch (F50 Performance Plan)

R65 is realised in (realises)

Domain: F1 Work
Range: F20 Self-contained Expression
Superproperty of: R2 has representative expression (is representative expression for)
R13 is realised in (realises)
R56 is realised in (realises)
R69 is realised in (realises)
R70 is realised in (realises)

Subproperty of: P130 shows features of (features are also found on)

Quantification: (0:n,1:1)

Scope note: ??????

Examples: Dante's "Inferno" (F21) *R2 has representative expression* The Italian text of Dante's "Inferno" as found in the authoritative critical edition *La Commedia secondo l'antica vulgata a cura di Giorgio Petrocchi*, Milano: Mondadori, 1966-67 (= Le Opere di Dante Alighieri, Edizione Nazionale a cura della Società Dantesca Italiana, VII, 1-4) (F20)

R66 recorded (was recorded through)

Domain: F55 Recording Event
Range: E5 Event
Superproperty of:
Subproperty of:)

Quantification: (1:n,0:n)

Scope note: ??????/

Examples: The making of the recording of the third alternate take of the musical work titled "Blue Hawaii" as performed by Elvis Presley in Hollywood, Calif., Radio Recorders, on March 22nd, 1961 (F55) *R66 recorded* Elvis Presley's performance of the musical work titled "Blue Hawaii" in Hollywood, Calif., Radio Recorders, on March 22nd, 1961 (F52)

R67 created (was created through)

Domain: F55 Recording Event
Range: F56 Recording
Superproperty of:
Subproperty of: R22 created (was created by)

Quantification: (1:n,1:n)

Scope note: ?????

Examples: The making of the recording of the third alternate take of the musical work titled "Blue Hawaii" as performed by Elvis Presley in Hollywood, Calif., Radio Recorders, on March 22nd, 1961 (F55) *R67 created* The set of signs that make up the third alternate take of the musical work titled "Blue Hawaii" as performed by Elvis Presley in Hollywood, Calif., Radio Recorders, on March 22nd, 1961 (F56)

R68 realised (was realised through)

Domain: F55 Recording Event
Range: F53 Recording Work
Superproperty of:
Subproperty of: R49 created a realization of (was realised through)

Quantification: (0:1,0:n)

Scope note: ??????

Examples: The making of the recording of the third alternate take of the musical work titled "Blue Hawaii" as performed by Elvis Presley in Hollywood, Calif., Radio Recorders, on March 22nd, 1961 (F55) *R68 realised* The concept of the third alternate take of the musical work titled "Blue Hawaii" as performed by Elvis Presley in Hollywood, Calif., Radio Recorders, on March 22nd, 1961 (F53)

R69 is realised in (realises)

Domain: F51 Performance Work
Range: F50 Performance Plan
Superproperty of:
Subproperty of: R65 is realised in (realises)

Quantification: (0:n,1:1)

Scope note: ?????

Examples: The concept of Sergei Radlov's mise-en-scène of a Yiddish translation of the textual work known as "King Lear" in Moscow in 1935 (F51) *R69 is realised in* The set of instructions for the production of a Yiddish translation of the textual work known as "King Lear", as directed by Sergei Radlov in Moscow in 1935 (F50)

The concept of Pina Bausch's choreography of the ballet titled "Rite of spring" in Wuppertal in 1975 (F51) *R69 is realised in* The set of instructions for the production of the ballet titled "Rite of spring", as choreographed by Pina Bausch in Wuppertal in 1975 (F50)

The concept of Bruno Walter's performance of Gustav Mahler's 9th symphony in 1961 (F51) *R69 is realised in* The set of instructions by Bruno Walter for performing Gustav Mahler's 9th symphony, delivered by him to the Columbia Symphony Orchestra during rehearsals in Hollywood in 1961 (as partially documented in the CD titled "Bruno Walter conducts and talks about Mahler symphony No. 9 : rehearsal & performance") (F50)

The concept of the "performance handbook" for Luigi Nono's musical work titled "À Pierre" (F51) *R69 is realised in* The set of instructions contained in the "performance handbook" for Luigi Nono's musical work titled "À Pierre" (F50)

R70 is realised in (realises)

Domain: F53 Recording Work
Range: F56 Recording
Superproperty of:
Subproperty of: R65 is realised in (realises)

Quantification: (0:n,0:1)

Scope note: ???????

Examples: The concept of the third alternate take of the musical work titled "Blue Hawaii" as performed by Elvis Presley in Hollywood, Calif., Radio Recorders, on March 22nd, 1961 (F53) *R70 is realised in* The set of signs that make up the third alternate take of the musical work titled "Blue Hawaii" as performed by Elvis Presley in Hollywood, Calif., Radio Recorders, on March 22nd, 1961 (F56)

CLP2 should have type (should be type of)

Domain: F3 Manifestation Product Type
Range: E55 Type
Superproperty of:
Subproperty of:

Quantification: (0:n,0:n)

Scope note: This property associates a publication, i.e. an instance of F3 Manifestation Product Type, with an instance of E55 Type, which all exemplars of that publication should belong to, as long as

they are recognised as exemplars of that publication. Typically, this property is observed on one exemplar of a publication, and extrapolated to all other exemplars of the same publication. This logical inference is an induction along the path that can be modelled as: F3 Manifestation Product Type *R10B is type of* F5 Item *P41B was classified by* E17 Type Assignment *P42 assigned* E55 Type.

It can happen that a given exemplar, or subset of exemplars, originally produced, or intended to be produced, with that characteristic, accidentally lacks it. This fact should be recorded as a property of F5 Item, and not of F3 Manifestation Product Type.

Examples: The sound recording titled "The Glory (????) of the human voice", identified by label and label number "RCA Victor Gold Seal GD61175", containing recordings of musical works performed by Florence Foster Jenkins (F3) *CLP2 should have type* sound recording (E55)

The sound recording titled "The Glory (????) of the human voice", identified by label and label number "RCA Victor Gold Seal GD61175", containing recordings of musical works performed by Florence Foster Jenkins (F3) *CLP2 should have type* kind of sound: monaural (E55)

CLP43 should have dimension (should be dimension of)

Domain: F3 Manifestation Product Type
Range: E54 Dimension
Superproperty of:
Subproperty of:

Quantification: (1:n,1:1)

Scope note: This property associates a publication, i.e. an instance of F3 Manifestation Product Type, with an instance of E54 Dimension, which all exemplars of that publication should have, as long as they are recognised as exemplars of that publication. Typically, this property is observed on one exemplar of a publication, and extrapolated to all other exemplars of the same publication. This logical inference is an induction along the path that can be modelled as: F3 Manifestation Product Type *R10B is type of* F5 Item *P39 was measured by* E16 Measurement *P40 observed dimension* E54 Dimension.

It can happen that a given exemplar, or subset of exemplars, originally produced, or intended to be produced, with that characteristic, accidentally lacks it. This fact should be recorded as a property of F5 Item, and not of F3 Manifestation Product Type.

Examples: The publication titled "Functional Requirements for Bibliographic Records: final report", published by K. G. Saur in 1998, identified by ISBN "3-598-11382-X" (F3) *CLP43 should have dimension* height of the individual copy of "Functional Requirements for Bibliographic Records: final report" that I have at hand and that I observed while describing it (E54) *P3 has note* "24 cm" (E62) [or, alternatively: *P90 has value* "24" (E60) and *P91 has unit* "cm" (E58)]

The jigsaw puzzle titled "Map of the New York city subway system", designed by Stephen J. Voorhies and released around 1954 by the Union Dimes Savings Bank (F3) *CLP43 should have dimension* length and height of the exemplar held and catalogued by the Library of Congress (E54) *P3 has note* "46 x 29 cm" (E62)

CLP45 should consist of (should be incorporated in)

Domain: F3 Manifestation Product Type
Range: E57 Material
Superproperty of:
Subproperty of:

Quantification: (0:n,0:n)

Scope note: This property associates a publication, i.e. an instance of F3 Manifestation Product Type, with an instance of E57 Material, which all exemplars of that publication should consist of, as long as they are recognised as exemplars of that publication. Typically, this property is observed on one exemplar of a publication, and extrapolated to all other exemplars of the same publication. This logical inference is an induction along the path that can be modelled as: F3 Manifestation Product Type *R10B is type of* F5 Item *P41B was classified by* E17 Type Assignment *P42 assigned* E57 Material.

It can happen that a given exemplar, or subset of exemplars, originally produced, or intended to be produced, with that characteristic, accidentally lacks it. This fact should be recorded as a property of F5 Item, and not of F3 Manifestation Product Type.

Examples: The jigsaw puzzle titled "Map of the New York city subway system", designed by Stephen J. Voorhies and released around 1954 by the Union Dimes Savings Bank (F3) *CLP45 should consist of* cardboard (E57)

CLP46 should be composed of (may form part of)

Domain: F3 Manifestation Product Type
Range: F3 Manifestation Product Type
Superproperty of:
Subproperty of:

Quantification: (0:n,0:n)

Scope note: This property associates an instance of F3 Manifestation Product Type which prescribes that all its Items will contain as part an Item of another instance of F3 Manifestation Product Type with that instance of F3 Manifestation Product Type.

Examples: The publication product identified by ISBN "0618260587" and consisting of a 3-volume edition of J.R.R. Tolkien's "The Lord of the rings" (F3) *CLP46 should be composed of* The publication product identified by ISBN "0618260595" and consisting of an edition of J.R.R Tolkien's "The two towers" (F3)

The publication product issued by Deutsche Grammophon in 1998 and consisting of a recording of Richard Wagner's "Der fliegende Holländer" as performed in 1991 by Plácido Domingo, Cheryl Studer et al., and conducted by Giuseppe Sinopoli (F3) *CLP46 should be composed of* The publication product consisting of printed programme notes and libretto with French and English translations (F3)

CLP57 should have number of parts

Domain: F3 Manifestation Product Type
Range: E60 Number
Superproperty of:
Subproperty of:

Quantification: (1:1,0:n)

Scope note: This property associates a publication, i.e. an instance of F3 Manifestation Product Type, with an instance of E60 Number, which denotes the number of physical units all exemplars of that publication should consist of, as long as they are recognised as complete exemplars of that publication. Typically, this property is observed on one exemplar of a publication, and extrapolated to all other exemplars of the same publication. This logical inference is an induction along the path that can be modelled as: F3 Manifestation Product Type *R10B is type of* F5 Item *P57has number of parts E60 Number*.

It can happen that a given exemplar, or subset of exemplars, originally produced, or intended to

be produced, with that characteristic, accidentally lacks it. This fact should be recorded as a property of F5 Item, and not of F3 Manifestation Product Type.

Examples: The jigsaw puzzle titled "Map of the New York city subway system", designed by Stephen J. Voorhies and released around 1954 by the Union Dimes Savings Bank (F3) *CLP57 should have number of parts* 76 (E60) [Number of physical units of the exemplar held by the Library of Congress, as observed by a cataloguer from the Library of Congress when he/she catalogued that particular exemplar and recorded the statement: "1 jigsaw puzzle (ca. 76 pieces)"]

The publication titled "History of costume: in slides, notes, and commentaries" by Jeanne Button, Patricia Quinn Stuart, and Stephen Sbarge, released by Slide Presentations (New York) ca. 1975 (F3) *CLP57 should have number of parts* 1,491 (E60) [Number of physical units of the exemplar held by the Gelman Library of the George Washington University, as observed by a cataloguer from the Gelman Library of the George Washington University when he/she catalogued that particular exemplar and recorded the statement: "1,491 slides in 14 slide trays + 6 ring binders in cases (30 x 29 cm.)"]

CLP104 subject to (applies to)

Domain: F3 Manifestation Product Type
Range: E30 Right
Superproperty of:
Subproperty of:

Quantification: (0:n,1:1)

Scope note: This property associates a publication, i.e. an instance of F3 Manifestation Product Type, with an instance of E30 Right, which applies to all exemplars of that publication, as long as they are recognised as exemplars of that publication.

The rights covered by this property may include: acquisition or access authorisation; terms of availability; access restrictions on the Manifestation Product Type; etc.

Examples: The publication titled "Recent poems" by the author named "Stephen Spender", released by the publisher named "Anvil Press Poetry" in 1978 and identified by ISBN "0856460516" (F3) *CLP104 subject to* Availability restricted to Anvil Press Poetry subscribers (E30) [*P3 has note* "This edition […] is available only to Anvil Press Poetry subscribers" (E62)]

CLP105 right held by (right on)

Domain: F3 Manifestation Product Type
Range: E39 Actor
Superproperty of:
Subproperty of:

Quantification: (0:n,0:n)

Scope note: This property associates a publication, i.e. an instance of F3 Manifestation Product Type, with an instance of E39 Actor, who holds an instance of E30 Right on all exemplars of that publication, as long as they are recognised as exemplars of that publication.

Examples: The publication titled "Recent poems" by the author named "Stephen Spender", released by the publisher named "Anvil Press Poetry" in 1978 and identified by ISBN "0856460516" (F3) *CLP105 right held by* Anvil Press Poetry (F7)

CLR5 should carry (should be carried by)

Domain: F3 Manifestation Product Type
Range: F41 Publication Expression
Superproperty of:
Subproperty of:

Quantification: (1:1,0:1)

Scope note: This property associates a publication, i.e. an instance of F3 Manifestation Product Type, with an instance of F41 Publication Expression, which all exemplars of that publication should carry, as long as they are recognised as complete exemplars of that publication. Typically, this property is observed on one exemplar of a publication, and extrapolated to all other exemplars of the same publication. This logical inference is an induction along the path that can be modelled as: F3 Manifestation Product Type *R10B is type of* F5 Item *R5 carries* F41 Publication Expression.

It can happen that a given exemplar, or a subset of exemplars, originally produced, or intended to be produced with that characteristic, accidentally lacks part of the publication expression. This fact should be recorded as a property of F5 Item, and not of F3 Manifestation Product Type.

Examples: The publication, dated 1972, titled "The complete poems of Stephen Crane, edited with an introduction by Joseph Katz" (ISBN "0-8014-9130-4") (F3) *CLP128 should carry* The overall content of the book identified by ISBN "0-8014-9130-4", i.e.: the text of Stephen Crane's complete poems as edited by Joseph Katz, the numbering system introduced by Joseph Katz in order to identify each individual poem by Stephen Crane, page numbers, the text of Joseph Katz's dedication, preface, acknowledgements, and introduction, the table of contents, the index of first lines, the statements found on title page, back of title page (including CIP bibliographic record), cover front, back front, and spine, and the layout of the publication, and the occasional statement "[NO STANZA BREAK]" (F41)

FRBR to $FRBR_{OO}$ mapping

This document defines the mapping between the $FRBR_{ER}$ model (**Functional Requirements for Bibliographic Records** http://www.ifla.org/VII/s13/frbr/frbr.pdf) to $FRBR_{OO}$ (FRBR object-oriented definition and mapping of the $FRBR_{ER}$ (version 0.6.7 - August 2006))

Unit of Information	**Condition**	
Work		F1 Work
Work		F21 Complex Work
Work		F46 Individual Work
Work		F48 Aggregation Work
Work		F43 Publication Work
Work		F22 Serial Work
Work: Title of the work		F1 Work P102 has title E35 Title
Work: Form of work		F1 Work R1 has constraining supertype E55 Type
Work: Date of the work		F1 Work R21 was initiated by F30 Work Conception P4 has timespan E52 Timespan P78 is identified by E50 Date
Work: Other distinguishing characteristics		F21 Complex Work P1 is identified by F14 Identifier
Work: Intended termination	if no intended termination it is an instance of F22 Serial Work	F22 Serial Work
Work: Intended termination	if it has an intended termination it is an instance of F46 Individual Work	F46 Individual Work
Work: Intended audience		F1 Work P103 was intended for E55 Type
Work: Context for the work		F1 Work R21 was initiated by F30 Work Conception
Work: Medium of performance (Musical work)		F21 Complex Work R2 has representative expression F2 Expression P2 has type E55 Type {Medium}
Work: Medium of performance (Musical work)		F1 Work R1 has constraining supertype E55 Type {Medium}
Work: Numeric designation (Musical work)		F1 Work P1 is identified by F14 Identifier R51 consists of F13 Name
Work: Key (Musical work)		F1 Work P1 is identified by F14 Identifier R51 consists of F13 Name
Work: Coordinates (Cartographic work)		F1 Work P129 is about E27 Site P59 is located in or within E53 Place P87 is identified by E47 Spatial Coordinates
Work: Equinox (Cartographic work)		F1 Work P129 is about E27 Site P59 is located in or within E53 Place P87 is identified by E47 Spatial Coordinates
Work: is realized through (Expression)		F21 Complex Work R2 has representative expression F2 Expression
Work: is realized through		F21 Individual Work R13 is realised in

Comment [b1]: The range of R2 is the F20 Self-Contained Expression

Unit of Information	Condition	
(Expression)		F20 Self-Contained Expression
Work: is realized through (Expression)		F46 Individual Work R56 is realised in F20 Self-Contained Expression
Work: is realized through (Expression)		F2 Expression R22 was created by F31 Expression Creation R49 created a realisation of F46 Individual Work
Work: is realized through (Expression)		F46 Individual Work R49 was realised through F31 Expression Creation R22 created F2 Expression
Work: is created by (Person, Corporate body)		F1 Work R21 was initiated by F30 Work Conception P14 carried out by (P14.1 in the role of: E55 Type = Creator) E39 Actor
Work: has as subject		F1 Work P129 is about E1 CRM Entity
Work: is subject of (Work)		F1 Work P129 is subject of F1 Work
Work: has a successor (Work)		F1 Work R57 has successor F1 Work
Work: is a successor to (Work, Expression)		F1 Work R57 is logical successor of F1 Work
Work: has a supplement (Work)		~~F1 Work R12 is member of F21 Complex work R12 has member F1 Work~~ F2 expression: R11 *is composed of*: F2 expression
Work: supplements (Work, Expression)		~~F1 Work R12 is member of F21 Complex work R12 has member F1 Work~~ F2 expression: R11 *is composed of*: F2 expression
Work: has a complement (Work)		~~F1 Work R12 is member of F21 Complex work R12 has member F1 Work~~ F2 expression: R11 *is composed of*: F2 expression
Work: complements (Work)		~~F1 Work R12 is member of F21 Complex work R12 has member F1 Work~~ F2 expression: R11 *is composed of*: F2 expression
Work: has a summary (Work)		F1 Work R58 has derivative (R58.1 has type = "summary") F1 Work
Work: is a summary of (Work)		F1 Work R58 is derivative of (R58.1 has type = "summary") F1 Work
Work: has adaptation (Work)		F1 Work R58 has derivative (R58.1 has type = "adaptation") F1 Work
Work: is an adaptation of (Work, Expression)		F1 Work R58 is derivative of (R58.1 has type = "adaptation") F1 Work
Work: has a transformation (Work)		F1 Work R58 has derivative (R58.1 has type = "transformation") F1 Work
Work: is a transformation of (Work, Expression)		F1 Work R58 is derivative of (R58.1 has type = "transformation") F1 Work
Work: has an imitation (Work)		F1 Work R58 has derivative (R58.1 has type = "imitation") F1 Work
Work: is an imitation of (Work, Expression)		F1 Work R58 is derivative of (R58.1 has type = "imitation") F1 Work
Work: has part (Work)		F21 Complex Work R12 has member F1 Work
Work: is part of (Work)		F1 Work R12 is member of F21 Complex Work
Expression		F2 Expression

Comment [b2]: It is not a work to work relation, it is an expression to expression relation (minutes Jun 2006)

Comment [b3]: It is not a work to work relation, it is an expression to expression relation (minutes Jun 2006)

Comment [b4]: It is not a work to work relation, it is an expression to expression relation (minutes Jun 2006)

Comment [b5]: It is not a work to work relation, it is an expression to expression relation (minutes Jun 2006)

Comment [b6]: It is not a work to work relation, it is an expression to expression relation (minutes Jun 2006)

Comment [b7]: It is not a work to work relation, it is an expression to expression relation (minutes Jun 2006)

Unit of Information	Condition	
Expression		F20 Self-Contained Expression
Expression		F41 Publication Expression
Expression		F23 Expression Fragment
Expression: Title of the expression		F2 Expression P102 has title E35 Title
Expression: Form of the expression		F2 Expression P2 has type E55 Type {Form}
Expression: Date of the expression		F2 Expression R22 was created by F31 Expression Creation
Expression: Language of the expression		F2 Expression (instantiated as E33 Linguistic Object) P72 has language E56 Language
Expression: Other distinguishing characteristics		F2 Expression P1 is identified by F25 Expression Identifier P106 is composed of E33 Linguistic Object
Expression: Extensibility of expression		F20 Self-Contained Expression R56 realises F1 Work R12 is member of F22 Serial Work P3 has note E62 String
Expression: Revisability of expression		F20 Self-Contained Expression R56 realises F1 Work R12 is member of F22 Serial Work P3 has note E62 String
Expression: Extent of the expression		F2 Expression P43 has dimension E54 Dimension
Expression: Summarization of content		F41 Expression P106 is composed of F2 Expression (of type summary)
Expression: Context for the expression		F2 Expression R22 was created by F31 Expression Creation
Expression: Critical response to the expression		F2 Expression R56 realises F46 Individual Work R12 is member of F21 Complex Work R12 has member F46 Individual Work (of type review, critique, etc?)
Expression: Use restrictions on the expression		F2 Expression P104 is subject to E30 Right
Expression: Sequencing pattern (Serial)		F20 Self-Contained Expression R13 realises F22 Serial work P3 has note E62 String
Expression: Sequencing pattern (Serial)		F20 Self-Contained Expression R13 realises F22 Serial work R62 has issuing rules E29 Design or Procedure
Expression: Expected regularity of issue (Serial)		F20 Self-Contained Expression R13 realises F22 Serial work P3 has note E62 String
Expression: Expected regularity of issue (Serial)		F20 Self-Contained Expression R13 realises F22 Serial Work R62 has issuing rules E29 Design or Procedure
Expression: Expected frequency of issue (Serial)		F20 Self-Contained Expression R13 realises F22 Serial work P3 has note E62 String
Expression: Expected frequency of issue (Serial)		F20 Self-Contained Expression+C32 R13 realises F22 Serial Work R62 has issuing rules E29 Design or Procedure
Expression: Type of score (Musical notation)		F2 Expression P2 has type E55 {Type of score} Type
Expression: Medium of performance (Musical notation or recorded sound)		F2 Expression P2 has type E55 {Medium of performance} Type

Unit of Information	Condition	
Expression: Scale (Cartographic image/object)		F2 Expression (Visual Item) P138 represents (P138.1 has type = "Scale") E1 CRM Entity
Expression: Projection (Cartographic image/object)		F2 Expression (Visual Item) P138 represents (P138.1 has type = "Projection") E1 CRM Entity
Expression: Presentation technique (Cartographic image/Object)		F2 Expression P2 has type E55 Type {Technique}
Expression: Representation of relief (Cartographic image/object)		F2 Expression P2 has type E55Type {Technique}
Expression: Geodetic, grid, and vertical measurement (Cartographic image/object)		F2 Expression P2 has type E55 Type {Different typologies}
Expression: Recording technique (Remote sensing image)		F2 Expression P2 has type E55 Type {Technique}
Expression: Special characteristics (Remote sensing image)		F2 Expression P2 has type E55 Type {Technique}
Expression: Special characteristics (Remote sensing image)		F2 Expression P3 has note E6 String
Expression: Technique (Graphic of projected image)		F2 Expression P2 has type E55 Type {Technique}
Expression: is a realization of		F2 Expression R2 is representative expression for F21 Complex Work
Expression: is a realization of		F20 Self-Contained Expression R13 realises F21 Complex Work
Expression: is a realization of		F20 Self-Contained Expression R56 realises F46 Individual Work R12 is member of F21 Complex Work
Expression: is a realization of		F2 Expression R22 was created by F31 Expression Creation R49 created a realisation of F46 Individual Work R12 is member of F21 Complex Work
Expression: is embodied in		F2 Expression R3 has representative manifestation product type F3 Manifestation Product Type
Expression: is embodied in		F2 Expression R7 has representative manifestation-singleton F4 Manifestation Singleton
Expression: is embodied in		F2 Expression R9 carriers provided by F3 Manifestation Product Type
Expression: is embodied in		F41 Publication Expression CLR5 should be carried by F3 Manifestation Product Type
Expression: is embodied in		F2 Expression R22 was created by F31 Expression creation R45 created F4 Manifestation Singleton
Expression: is realized by		F2 Expression R22 was created by F31 Expression Creation P14 carried out by (P14.1 in the role of: E55 Type = Realises) E39 Actor
Expression: is subject of		F2 Expression P129 is subject of F1 Work
Expression: has an abridgement		F20 Self-Contained Expression R56 realises F46 Individual Work R58 has

Unit of Information	Condition	
		derivative F1 Work
Expression: is an abridgement of		F20 Self-Contained Expression R56 realises F46 Individual Work R58 is derivative of F1 Work
Expression: has a revision		F20 Self-Contained Expression R56 realises F46 Individual Work R58 has derivative F1 Work
Expression: is a revision of		F20 Self-Contained Expression R56 realises F46 Individual Work R58 is derivative of F1 Work
Expression: has a translation		F20 Self-Contained Expression R56 realises F46 Individual Work R58 has derivative F1 Work
Expression: is a translation of		F20 Self-Contained Expression R56 realises F46 Individual Work R58 is derivative of F1 Work
Expression: has an arrangement		F20 Self-Contained Expression R56 realises F46 Individual Work R58 has derivative F1 Work
Expression: is an arrangement of		F20 Self-Contained Expression R56 realises F46 Individual Work R58 is derivative of F1 Work
Expression: has a successor		F20 Self-Contained Expression R56 realises F46 Individual Work R57 has successor F1 Work
Expression: is a successor to		F20 Self-Contained Expression R56 realises F46 Individual Work R57 is logical successor of F1 Work
Expression: has a supplement		F20 Self-Contained Expression R56 realises F46 Individual Work R12 is member of F21 Complex Work R12 has member F1 Work
Expression: supplements		F20 Self-Contained Expression R56 realises F46 Individual Work R12 is member of F21 Complex Work R12 has member F1 Work
Expression: has a complement		F20 Self-Contained Expression R56 realises F46 Individual Work R12 is member of F21 Complex Work R12 has member F1 Work
Expression: complements		F20 Self-Contained Expression R56 realises F46 Individual Work R12 is member of F21 Complex Work R12 has member F1 Work
Expression: has a summary		F20 Self-Contained Expression R56 realises F46 Individual Work R58 is derivative of (R58.1 has type = "summary") F1 Work
Expression: is a summary of		F20 Self-Contained Expression R56 realises F46 Individual Work R58 is derivative of (R58.1 has type = "summary") F1 Work
Expression: has an adaptation		F20 Self-Contained Expression R56 realises F46 Individual Work R58 is derivative of (R58.1 has type =

Unit of Information	Condition	
		"adaptation") F1 Work
Expression: is an adaptation of		F20 Self-Contained Expression R56 realises F46 Individual Work R58 is derivative of (R58.1 has type = "adaptation") F1 Work
Expression: has a transformation		F20 Self-Contained Expression R56 realises F46 Individual Work R58 is derivative of (R58.1 has type = "transformation") F1 Work
Expression: is a transformation of		F20 Self-Contained Expression R56 realises F46 Individual Work R58 is derivative of (R58.1 has type = "transformation") F1 Work
Expression: has an imitation		F20 Self-Contained Expression R56 realises F46 Individual Work R58 is derivative of (R58.1 has type = "imitation") F1 Work
Expression: is an imitation of		F20 Self-Contained Expression R56 realises F46 Individual Work R58 is derivative of (R58.1 has type = "imitation") F1 Work
Expression: has part		F2 Expression R15 has fragment F23 Expression Fragment
Expression: has part		F2 Expression R11 is composed of F20 Self-Contained Expression
Expression: is part of		F23 Expression Fragment R15 is fragment of F2 Expression
Expression: is part of		F20 Self-Contained Expression R11 forms part of F2 Expression
Manifestation		F3 Manifestation Product Type
Manifestation: Title of the manifestation		F3 Manifestation Product Type P102 has title E35 Title
Manifestation: Title of the manifestation		F4 Manifestation Singleton P102 has title E35 Title
Manifestation: Statement of responsibility		F3 Manifestation Product Type CLR5 should carry F41 Publication Expression P106 is composed of E33 Linguistic Object P3 has note E62 String
Manifestation: Statement of responsibility		F4 Manifestation Singleton P128 carries F2 Expression P106 is composed of E33 Linguistic Object P3 has note E62 String
Manifestation: Edition/Issue designation		F3 Manifestation Product Type CLR5 should carry F41 Publication Expression P106 is composed of E33 Linguistic Object P3 has note E62 String
Manifestation: Edition/Issue designation		F4 Manifestation Singleton P128 carries F2 Expression P106 is composed of E33 Linguistic Object P3 has note E62 String
Manifestation: Place of publication/distribution	Publishing:	F3 Manifestation Product Type CLR5 should carry F41 Publication Expression P94 was created by F45 Publication Event P14 carried out by E39 Actor P74

Unit of Information	Condition	
		has current or former residence E53 Place P87 is identified by E44 Place Appellation
Manifestation: Place of publication/distribution	Publishing:	F3 Manifestation Product Type CLR5 should carry F41 Publication Expression P106 is composed of E33 Linguistic Object P3 has note E62 String
Manifestation: Place of publication/distribution	Publishing:	F4 Manifestation Singleton R45 was created by F31 Expression Creation P14 carried out by E39 Actor P74 has current or former residence E53 Place P87 is identified by E44 Place Appellation
Manifestation: Place of publication/distribution	Distribution:	P104 is subject to E30 right (P2 has type = "distribution right") P75 is posessed by E39 Actor P74 has current or former residence E53 Place P87 is identified by E44 Place Appellation
Manifestation: Publisher/distributor	Publishing:	F3 Manifestation Product Type CLR5 should carry F41 Publication Expression P94 was created by F45 Publication Event P14 carried out by E39 Actor P131 is identified by E82 Actor Appellation
Manifestation: Publisher/distributor	Publishing:	F3 Manifestation Product Type CLR5 should carry F41 Publication Expression P106 is composed of E33 Linguistic Object P3 has note E62 String
Manifestation: Date of publication/distribution		F3 Manifestation Product Type CLR5 should carry F41 Publication Expression P106 is composed of E33 Linguistic Object P3 has note E62 String
Manifestation: Date of publication/distribution		F3 Manifestation Product Type CLR5 should carry F41 Publication Expression P94 was created by F45 Publication Event P4 has time-span E52 Time-Span P78 is identified by E49 Time Appellation
Manifestation: Date of publication/distribution		F3 Manifestation Product Type CLR5 should carry F41 Publication Expression P94 was created by E65 Creation Event P4 has time-span E52 Time-Span P82 at some time within E61 Time Primitive
Manifestation: Date of publication/distribution		F4 Manifestation-Singleton R45 was created by F31 Expression Creation P4 has time-span E52 Time-Span P82 at some time within E61 Time Primitive
Manifestation: Fabricator/manufacturer		F3 Manifestation Product Type CLP108 should have been produced by F40 Carrier Production Event P14 carried out by E39 Actor P131 is identified by E82 Actor Appellation
Manifestation: Fabricator/manufacturer		F4 Manifestation-Singleton R45 was created F31 Expression Creation P14 carried out by E39 Actor P131 is identified by E82 Actor Appellation

Unit of Information	Condition	
Manifestation: Series statement		F3 Manifestation Product Type P3 has note (P3.1 = "Series statement") E62 String
Manifestation: Series statement		F4 Manifestation Singleton P3 has note (P3.1 = "Series statement") E62 String
Manifestation: Series statement		F3 Manifestation Product Type CLR5 should carry F41 Publication Expression P106 is composed of E33 Linguistic Object P3 has note E62 String
Manifestation: Form of carrier		F3 Manifestation Product Type CLP2 should have type E55 Type {Form of carrier}
Manifestation: Form of carrier		F4 Manifestation Singleton P2 has type E55 Type {Form of carrier}
Manifestation: Extent of the carrier		F3 Manifestation Product Type P3 has note (P3.1 = "Extent of the carrier") E62 String
Manifestation: Extent of the carrier		F4 Manifestation Singleton P3 has note (P3.1 = "Extent of the carrier") E62 String
Manifestation: Extent of the carrier		F3 Manifestation Product Type CLP57 should have number of parts E60 Number
Manifestation: Extent of the carrier		F4 Manifestation Singleton P57 has number of parts E60 Number
Manifestation: Physical medium		F3 Manifestation Product Type P3 has note (P3.1 = "Physical medium") E62 String
Manifestation: Physical medium		F4 Manifestation Singleton P3 has note (P3.1 = "Physical medium") E62 String
Manifestation: Physical medium		F3 Manifestation Product Type CLP45 should consist of E57 Material
Manifestation: Physical medium		F4 Manifestation Singleton P45 consists of E57 Material
Manifestation: Capture mode		F3 Manifestation Product Type P3 has note (P3.1 = "Capture mode") E62 String
Manifestation: Capture mode		F4 Manifestation Singleton P3 has note (P3.1 = "Capture mode") E62 String
Manifestation: Capture mode		F3 Manifestation Product Type CLP2 should have type E55 Type {Capture mode}
Manifestation: Capture mode		F4 Manifestation Singleton P2 has type E55 Type {Capture mode}
Manifestation: Dimensions of the carrier		F3 Manifestation Product Type CLP43 should have dimension E54 Dimension
Manifestation: Dimensions of the carrier		F4 Manifestation Singleton P43 has dimension E54 Dimension
Manifestation: Manifestation identifier		F3 Manifestation Product Type P1 is identified by F14 Identifier
Manifestation: Manifestation identifier		F4 Manifestation Singleton P47 is identified by E42 Object Identifier
Manifestation: Source for acquisition/access authorization		F3 Manifestation Product Type CLP104 is subject to E30 Right P3 has note E62 String
Manifestation: Source for acquisition/access authorization		F3 Manifestation Product Type CLP105 right held by E39 Actor P131 is identified

Unit of Information	Condition	
		by E82 Actor Appellation
Manifestation: Source for acquisition/access authorization		F4 Manifestation Singleton P104 is subject to E30 Right P3 has note E62 String
Manifestation: Source for acquisition/access authorization		F4 Manifestation Singleton P105 right held by E39 Actor P131 is identified by E82 Actor Appellation
Manifestation: Source for acquisition/access authorization		F4 Manifestation Singleton P49 has former or current keeper E39 Actor P131 is identified by E82 Actor Appellation
Manifestation: Source for acquisition/access authorization		F4 Manifestation Singleton P51 has former or current owner E39 Actor P131 is identified by E82 Actor Appellation
Manifestation: Terms of availability		F3 Manifestation Product Type CLP104 is subject to E30 Right P3 has note E62 String
Manifestation: Terms of availability		F4 Manifestation Singleton P104 is subject to E30 Right P3 has note E62 String
Manifestation: Access restrictions on the manifestation		F3 Manifestation Product Type CLP104 is subject to E30 Right P3 has note E62 String
Manifestation: Access restrictions on the manifestation		F4 Manifestation Singleton P104 is subject to E30 Right P3 has note E62 String
Manifestation: Typeface (Printed book)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "Typeface") E62 String
Manifestation: Typeface (Printed book)	coded form	F3 Manifestation Product Type CLP2 should have type E55 Type {Typeface}
Manifestation: Typeface (Printed book)	descriptive form	F4 Manifestation Singleton P3 has note (P3.1 = "Typeface") E62 String
Manifestation: Typeface (Printed book)	coded form	F4 Manifestation Singleton P2 has type E55 Type {Typeface}
Manifestation: Type size (Printed book)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "Type size") E62 String
Manifestation: Type size (Printed book)	coded form	F3 Manifestation Product Type CLP2 should have type E55 Type {Type size}
Manifestation: Type size (Printed book)	descriptive form	F4 Manifestation Singleton P3 has note (P3.1 = "Type size") E62 String
Manifestation: Type size (Printed book)	coded form	F4 Manifestation Singleton P2 has type E55 Type {Type size}
Manifestation: Foliation (Hand-printed book)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "Foliation") E62 String
Manifestation: Foliation (Hand-printed book)	coded form	F3 Manifestation Product Type CLP2 should have type E55 Type {Foliation}
Manifestation: Foliation (Hand-printed book)	descriptive form	F4 Manifestation Singleton P3 has note (P3.1 = "Foliation") E62 String
Manifestation: Foliation (Hand-printed book)	coded form	F4 Manifestation Singleton P2 has type E55 Type {Foliation}
Manifestation: Collation (Hand-printed book)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "Collation") E62 String
Manifestation: Collation (Hand-printed book)	descriptive form	F4 Manifestation Singleton P3 has note (P3.1 = "Collation") E62 String
Manifestation: Publication status	coded form	F22 Serial Work P2 has type E55 Type

Unit of Information	Condition	
(Serial)		{Publication status}
Manifestation: Publication status (Serial)	descriptive form	F22 Serial Work P2 has note (P3.1 = "Publication status") E62 String
Manifestation: Numbering (Serial)		F3 Manifestation Product Type P1 is identified by F14 Identifier R51 consists of F13 Name
Manifestation: Playing speed (Sound recording)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "Playing speed") E62 String
Manifestation: Playing speed (Sound recording)	coded form	F3 Manifestation Product Type CLP2 should have type E55 Type {Playing speed}
Manifestation: Playing speed (Sound recording)	descriptive form	F4 Manifestation Singleton P3 has note (P3.1 = "Playing speed") E62 String
Manifestation: Playing speed (Sound recording)	coded form	F4 Manifestation Singleton P2 has type E55 Type {Playing speed}
Manifestation: Groove width (Sound recording)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "Groove width") E62 String
Manifestation: Groove width (Sound recording)	coded form	F3 Manifestation Product Type CLP2 should have type E55 Type {Groove width}
Manifestation: Groove width (Sound recording)	descriptive form	F4 Manifestation Singleton P3 has note (P3.1 = "Groove width") E62 String
Manifestation: Groove width (Sound recording)	coded form	F4 Manifestation Singleton P2 has type E55 Type {Groove width}
Manifestation: Kind of cutting (Sound recording)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "Kind of cutting") E62 String
Manifestation: Kind of cutting (Sound recording)	coded form	F3 Manifestation Product Type CLP2 should have type E55 Type {Kind of cutting}
Manifestation: Kind of cutting (Sound recording)	descriptive form	F4 Manifestation Singleton P3 has note (P3.1 = "Kind of cutting") E62 String
Manifestation: Kind of cutting (Sound recording)	coded form	F4 Manifestation Singleton P2 has type E55 Type {Kind of cutting}
Manifestation: Tape configuration (Sound recording)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "Tape configuration") E62 String
Manifestation: Tape configuration (Sound recording)	coded form	F3 Manifestation Product Type CLP2 should have type E55 Type {Tape configuration}
Manifestation: Tape configuration (Sound recording)	descriptive form	F4 Manifestation Singleton P3 has note (P3.1 = "Tape configuration") E62 String
Manifestation: Tape configuration (Sound recording)	coded form	F4 Manifestation Singleton P2 has type E55 Type {Tape configuration}
Manifestation: Kind of sound (Sound recording)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "Kind of sound") E62 String
Manifestation: Kind of sound (Sound recording)	coded form	F3 Manifestation Product Type CLP2 should have type E55 Type {Kind of sound}
Manifestation: Kind of sound (Sound recording)	descriptive form	F4 Manifestation Singleton P3 has note (P3.1 = "Kind of sound") E62 String
Manifestation: Kind of sound (Sound recording)	coded form	F4 Manifestation Singleton P2 has type E55 Type {Kind of sound}

Unit of Information	Condition	
Manifestation: Special reproduction characteristics (Sound recording)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "Reproduction characteristics") E62 String
Manifestation: Special reproduction characteristics (Sound recording)	coded form	F3 Manifestation Product Type CLP2 should have type E55 Type {Reproduction characteristics}
Manifestation: Special reproduction characteristics (Sound recording)	descriptive form	F4 Manifestation Singleton P3 has note (P3.1 = "Reproduction characteristics") E62 String
Manifestation: Special reproduction characteristics (Sound recording)	coded form	F4 Manifestation Singleton P2 has type E55 Type {Reproduction characteristics}
Manifestation: Colour (Image)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "Colour") E62 String
Manifestation: Colour (Image)	coded form	F3 Manifestation Product Type CLP2 should have type E55 Type {Colour}
Manifestation: Colour (Image)	descriptive form	F4 Manifestation Singleton P3 has note (P3.1 = "Colour") E62 String
Manifestation: Colour (Image)	coded form	F4 Manifestation Singleton P2 has type E55 Type {Colour}
Manifestation: Reduction ratio (Microform)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "Reduction ratio") E62 String
Manifestation: Reduction ratio (Microform)	coded form	F3 Manifestation Product Type CLP2 should have type E55 Type {Reduction Ratio}
Manifestation: Polarity (Microform or visual projection)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "Tape configuration") E62 String
Manifestation: Polarity (Microform or visual projection)	coded form	F3 Manifestation Product Type CLP2 should have type E55 Type {Tape configuration}
Manifestation: Generation (Microform or visual projection)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "Generation") E62 String
Manifestation: Generation (Microform or visual projection)	coded form	F3 Manifestation Product Type CLP2 should have type E55 Type {Generation}
Manifestation: Presentation format (Visual projection)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "Presentation format") E62 String
Manifestation: Presentation format (Visual projection)	coded form	F3 Manifestation Product Type CLP2 should have type E55 Type {Presentation format}
Manifestation: System requirements (Electronic resource)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "System requirements") E62 String
Manifestation: System requirements (Electronic resource)	coded form	F3 Manifestation Product Type CLP2 should have type E55 Type {System requirements}
Manifestation: File characteristics (Electronic resource)	descriptive form	F3 Manifestation Product Type P3 has note (P3.1 = "File characteristics") E62 String
Manifestation: File characteristics (Electronic resource)		F3 Manifestation Product Type CLP2 should have type E55 Type {File characteristics}
Manifestation: Mode of access (Remote access electronic resource)		F3 Manifestation Product Type R37 can be realised by F39 ProductionPlan

Unit of Information	Condition	
Manifestation: Access address (Remote access electronic resource)		F3 Manifestation Product Type R37 can be realised by F39 ProductionPlan
Manifestation: is the embodiment of		F3 Manifestation Product Type R3 is representative manifestation product type for F2 Expression
Manifestation: is the embodiment of		F3 Manifestation Product Type R9 comprises carriers of F2 Expression
Manifestation: is the embodiment of		F3 Manifestation Product Type CLR5 should carry F41 Publication Expression
Manifestation: is the embodiment of		F4 Manifestation Singleton R45 was created by F31 Expression Creation R22 has created F2 Expression
Manifestation: is the embodiment of		F4 Manifestation Singleton R7 is representative manifestation singleton for F2 Expression
Manifestation: is exemplified by		F3 Manifestation Product Type R10 is type of F5 Item
Manifestation: is produced by		F3 Manifestation Product Type R37 was realised by F39 Production Plan
Manifestation: is produced by		F3 Manifestation Product Type R38 was produced by F40 Carrier Production Event
Manifestation: is produced by		F4 Manifestation Singleton R45 was created by F31 Expression Creation P14 carried out by E39 Actor P131 is identified by E82 Actor Appellation
Manifestation: is subject of		F3 Manifestation Product Type P129 is subject of F1 Work
Manifestation: is subject of		F4 Manifestation Singleton P129 is subject of F1 Work
Manifestation: has part		F4 Manifestation Singleton P46 is composed of F4 Manifestation Singleton
Manifestation: has part		F3 Manifestation Product Type CLP46 may be composed of F3 Manifestation Product Type
Manifestation: is part of		F4 Manifestation Singleton P46 forms part of F4 Manifestation Singleton
Manifestation: is part of		F3 Manifestation Product Type CLP46 may form part of F3 Manifestation Product Type
Manifestation: has a reproduction		F3 Manifestation Product Type P125 was type of object used in F44 Reproduction Event R59 has produced E84 Information Carrier
Manifestation: is a reproduction of		F3 Manifestation Product Type R10 is type of F5 Item R59 was reproduced by F44 Reproduction Event P125 used object of type F3 Manifestation Product Type
Manifestation: has an alternate		F3 Manifestation Product Type R3 is representative manifestation product type for F2 Expression R3 has representative manifestation product type F3 Manifestation Product Type

Unit of Information	Condition	
Manifestation: is an alternate to		F3 Manifestation Product Type R3 is representative manifestation product type for F2 Expression R3 has representative manifestation product type F3 Manifestation Product Type
Item		F4 Manifestation Singleton
Item		F5 Item
Item: Item identifier		F4 Manifestation Singleton P47 is identified by E42 Object Identifier
Item: Item identifier		F5 Item P47 is identified by E42 Object Identifier
Item: Fingerprint		F4 Manifestation Singleton P1 is identified by E41 Appellation
Item: Fingerprint		F5 Item P1 is identified by E41 Appellation
Item: Provenance of the item		F4 Manifestation Singleton P49 har former or current keeper E39 Actor
Item: Provenance of the item		F4 Manifestation Singleton P51 har former or current owner E39 Actor
Item: Provenance of the item		F5 Item P49 has former or current keeper E39 Actor
Item: Provenance of the item		F5 Item P51 has former or current owner E39 Actor
Item: Marks/inscriptions		F4 Manifestation Singleton P65 shows visual item E37 Mark
Item: Marks/inscriptions		F5 Item P65 shows visual item E37 Mark
Item: Exhibition history		F4 Manifestation Singleton P12 was present at E7 Activity
Item: Exhibition history		F5 Item P12 was present at E7 Activity
Item: Condition of the item		F4 Manifestation Singleton P44 has condition state E3 Condition State
Item: Condition of the item		F5 Item P44 has condition state E3 Condition State
Item: Treatment history		F4 Manifestation Singleton P31 was modified by E11 Modification Event
Item: Treatment history		F5 Item P31 was modified by E11 Modification Event
Item: Scheduled treatment		F4 Manifestation Singleton P3 has note (P3.1 = "Scheduled treatment") E62 String
Item: Scheduled treatment		F5 Item P3 has note (P3.1 = "Scheduled treatment") E62 String
Item: Scheduled treatment		F4 Manifestation Singleton
Item: Scheduled treatment		F5 Item
Item: Access restrictions on the item		F4 Manifestation Singleton P104 is subject to E30 Right
Item: Access restrictions on the item		F5 Item P104 is subject to E30 Right
Item: exemplifies		F5 Item R10 has type F3 Manifestation Product Type
Item: is subject of		F5 Item P129 is subject of F1 Work
Item: is owned by		P5 Item P51 has former or current owner E39 Actor

Unit of Information	Condition	
Item: is owned by		P5 Item P50 har current keeper E39 Actor
Item: has part		F5 Item P46 is composed of F5 Item
Item: has part		F4 Manifestation Singleton P46 is composed of F4 Manifestation Singleton
Item: is part of		F5 Item P46 forms part of F5 Item
Item: is part of		F4 Manifestation Singleton P46 forms part of F4 Manifestation Singleton
has reconfiguration		F5 Item P46 is composed of F5 Item R10 has type F4 Manifestation Product Type
is a reconfiguration of		F5 Item P46 forms part of F5 Item R10 has type F4 Manifestation Product Type
has reproduction		F5 Item R10 has type F3 Manifestation Product Type P125 was type of object used in F44 Reproduction Event R59 has produced E84 Information Carrier
is a reproduction of (Manifestation, Item)		F5 Item R59 was reproduced by F44 Reproduction Event P125 used object of type F3 Manifestation Product Type R10 is type of F5 Item
Person		E21 Person
Person: Name of person		E21 Person P131 is identified by E82 Actor Appellation
Person: Dates of person	birthdate	E21 Person P98 was born E67 birth P4 has timespan E52 Timespan P78 is identified by E50 Date
Person: Dates of person	death	E21 Person P100 died in E69 Death P4 has timespan E52 Timespan P78 is identified by E50 Date
Person: Dates of person	was active in period	E21 Person P14 performed E7 Activity P4 has timespan E52 Timespan P78 is identified by E50 Date
Person: Dates of person	part of identifier	
Person: Title of person		E21 Person P2 has type E55 Type {Titles}
Person: Title of person		E21 Person P1 is identified by F13 Name R51 consists of F13 Name
Person: Other designation associated with the person		E21 Person P1 is identified by F13 Name R51 consists of F13 Name
Person: has created		E21 Person P14 performed F30 Work Conception R21 inititated F1 Work
Person: has realized		E21 Person P14 performed F31 Expression Creation R22 created F2 Expression
Person: has produced		E21 Person P14 performed F45 Publication Event R55 was created by F39 Production Plan R37 shows how to realise F3 Manifestation Product Type
Person: has produced		E21 Person P14 performed F40 Carrier Production Event R38 produced things of type F3 Manifestation Product Type
Person: has produced		E21 Person P14 performed F31 Expression Creation R45 created F4

Unit of Information	Condition	
		Manifestation Singleton
Person: is owner of		E21 Person P51 is former or current owner of F5 Item
Person: is owner of		E21 Person P51 is former or current owner of F4 Manifestation Singleton
Person: is subject of		E21 Person P129 is subject of F1 Work
Corporate Body		E74 Group
Corporate Body: Name of the corporate body		E74 Group P131 is identified by E82 Actor Appellation
Corporate Body: Number associated with the corporate body		E74 Group part of identifier
Corporate Body: Place associated with the corporate body	Place associated with an activity / event	E74 Group P13 carried out E7 Activity P7 took place at E53 Place P87 is identified by E44 Place Appellation
Corporate Body: Place associated with the corporate body	Location with which the corporate body is otherwise associated	E74 Group P74 has current or former residence E53 Place P87 is identified by E44 Place Appellation
Corporate Body: Date associated with the corporate body	Formation of a group,	E74 Group P95 was formed by E66 Formation P4 has timespan E52 Timespan P78 is identified by E50 Date
Corporate Body: Date associated with the corporate body	Timespan of the event (conference)	E74 Group P14 performed E7 Activity P4 has timespan E52 Timespan P78 is identified by E50 Date
Corporate Body: Other designation associated with the corporate body		name parts
Corporate Body: has created		E74 Group P14 performed F30 Work Conception R21 inititated F1 Work
Corporate Body: has realized		E74 Group P14 performed F31 Expression Creation R22 created F2 Expression
Corporate Body: has produced		E74 Group P14 performed F45 Publication Event R55 was created by F39 Production Plan R37 shows how to realise F3 Manifestation Product Type
Corporate Body: has produced		E74 Group P14 performed F40 Carrier Production Event R38 produced things of type F3 Manifestation Product Type
Corporate Body: has produced		E74 Group P14 performed F31 Expression Creation R45 created F4 Manifestation Singleton
Corporate Body: is owner of		E74 Group P51 is former or current owner of F5 Item
Corporate Body: is owner of		E74 Group P51 is former or current owner of F4 manifestation Singleton
Corporate Body: is subject of		E74 Group P129 is subject of F1 Work
Concept		F9 Concept
Concept: Term for the concept		F9 Concept P1 is identified by E41 Appellation

Unit of Information	**Condition**	
Concept: is subject of		F9 Concept P129 is subject of F1 Work
Object		E18 Physical Thing
Object: Term for the object		E18 Physical Thing P1 is identified by E41 Appellation
Object: is subject of		E18 Physical Thing P129 is subject of F1 Work
Event		E4 Period
Event: Term for the event		E4 Period P1 is identified by E41 Appellation
Event: is subject of		E4 Period P129 is subject of F1 Work
Place		E53 Place
Place: Term for the place		E53 Place P87 is identified by E44 Place Appellation
Place: is subject of		E53 Place P129 is subject of F1 Work

List of Referred CIDOC CRM Entities and Properties:

E1 CRM Entity
E3 Condition State
E4 Period
E6 Destruction
E7 Activity
E11 Modification
E12 Production
E13 Attribute Assignment
E15 Identifier Assignment
E18 Physical Thing
E21 Person
E24 Physical Man-Made Thing
E27 Site
E28 Conceptual Object
E29 Design or Procedure
E30 Right
E33 Linguistic Object
E35 Title
E37 Mark
E39 Actor
E41 Appellation
E42 Object Identifier
E44 Place Appellation
E47 Spatial Coordinates
E49 Time Appellation
E50 Date
E52 Time-Span
E53 Place
E54 Dimension
E55 Type
E56 Language
E57 Material
E60 Number
E61 Time Primitive
E62 String
E65 Creation
E66 Formation
E67 Birth
E69 Death
E72 Legal Object
E73 Information Object
E74 Group
E82 Actor Appellation
E84 Information Carrier

In the above table are presented the entities of CRM ver 4.2.1 that are referred in FRBRoo Model ver 0.8.1 or in in FRBR to FRBRoo mapping. Those which are marked blue are indirectly referred in $FRBR_{OO}$ Model ver 0.8.1, either as superclasses of classes defined in the model, or as more general domain or range of CRM properties

Property id	Property Name	Entity – Domain	Entity - Range
P1	is identified by (identifies)	E1 CRM Entity	E41 Appellation
P2	has type (is type of)	E1 CRM Entity	E55 Type
P3	has note	E1 CRM Entity	E62 String
P4	has time-span (is time-span of)	E2 Temporal Entity	E52 Time-Span
P7	took place at (witnessed)	E4 Period	E53 Place
P12	occurred in the presence of (was present at)	E5 Event	E77 Persistent Item
P13	destroyed (was destroyed by)	E6 Destruction	E18 Physical Thing
P14	carried out by (performed)	E7 Activity	E39 Actor
P31	has modified (was modified by)	E11 Modification	E24 Physical Man-Made Thing
P36	registered (was registered by):	E15 Identifier Assignment	E19 Physical Object
P37	assigned (was assigned by):	E15 Identifier Assignment	E42 Object Identifier
P43	has dimension (is dimension of)	E70 Thing	E54 Dimension
P44	has condition (condition of)	E18 Physical Thing	E3 Condition State
P45	consists of (is incorporated in)	E18 Physical Thing	E57 Material
P46	is composed of (forms part of)	E18 Physical Thing	E18 Physical Thing
P47	is identified by (identifies)	E19 Physical Object	E42 Object Identifier
P49	has former or current keeper (is former or current keeper of)	E18 Physical Thing	E39 Actor
P50	has current keeper (is current keeper of)	E18 Physical Thing	E39 Actor
P51	has former or current owner (is former or current owner of)	E18 Physical Thing	E39 Actor
P57	has number of parts	E19 Physical Object	E60 Number
P59	has section (is located on or within)	E18 Physical Thing	E53 Place
P65	shows visual item (is shown by)	E24 Physical Man-Made Thing	E36 Visual Item
P72	has language (is language of)	E33 Linguistic Object	E56 Language
P74	has current or former residence (is current or former residence of)	E39 Actor	E53 Place
P75	possesses (is possessed by)	E39 Actor	E30 Right
P78	is identified by (identifies)	E52 Time-Span	E49 Time Appellation
P82	at some time within	E52 Time-Span	E61 Time Primitive
P87	is identified by (identifies)	E53 Place	E44 Place Appellation
P94	has created (was created by)	E65 Creation	E28 Conceptual Object
P95	has formed (was formed by)	E66 Formation	E74 Group
P98	brought into life (was born)	E67 Birth	E21 Person
P100	was death of (died in)	E69 Death	E21 Person
P102	has title (is title of)	E71 Man-Made Thing	E35 Title
P103	was intended for (was intention of)	E71 Man-Made Thing	E55 Type
P104	is subject to (applies to)	E72 Legal Object	E30 Right
P105	right held by (has right on)	E72 Legal Object	E39 Actor
P106	is composed of (forms part of)	E73 Information Object	E73 Information Object
P108	has produced (was produced by):	E12 Production	E24 Physical Man-Made Thing
P125	used object of type (was type of object used in)	E7 Activity	E55 Type
P128	carries (is carried by)	E24 Physical Man-Made Thing	E73 Information Object
P129	is about (is subject of)	E73 Information Object	E1 CRM Entity
P131	is identified by (identifies)	E39 Actor	E82 Actor Appellation
P138	represents (has representation)	E36 Visual Item	E1 CRM Entity
P140	assigned attribute to (was attributed by)	E13 Attribute Assignment	E1 CRM Entity
P141	assigned (was assigned by)	E13 Attribute Assignment	E1 CRM Entity

In the above table are presented the properties of CRM ver 4.2.1 that are referred in FRBRoo Model ver 0.8.1 or in FRBR to FRBRoo mapping. Those which are marked blue are indirectly referred in $FRBR_{OO}$ Model ver 0.8.1, either as superproperties or subproperties of the properties defined in the $FRBR_{OO}$ model.

Referred CIDOC CRM Entities

In this chapter are described the entities of the CIDOC Conceptual Reference Model ver 4.2.1which are referred from ooFRBR Model.
The properties which are referred in ooFRBR Model are presented in bold face.

E1 CRM Entity

Superclass of: E2 Temporal Entity
E52 Time-Span
E53 Place
E54 Dimension
E77 Persistent Item

Scope note: This class comprises all things in the universe of discourse of the CIDOC Conceptual Reference Model.

It is an abstract concept providing for three general properties:
1. Identification by name or appellation
2. Classification by type, allowing further refinement of the specific subclass an instance belongs to
3. Attachment of free text for the expression of anything not captured by formal properties

With the exception of E59 Primitive Value, all other classes within the CRM are directly or indirectly specialisations of E1 CRM Entity.

Examples:

- the earthquake in Lisbon 1755 (E5)

Properties**:**

P1 is identified by (identifies): E41 Appellation
P2 has type (is type of): E55 Type
P3 has note: E62 String
(P3.1 has type: E55 Type)

E3 Condition State

Subclass of: E2 Temporal Entity

Scope note: This class comprises the states of objects characterised by a certain condition over a time-span.

It describes the prevailing physical condition of any material object or feature during a specific E52 Time Span.In general, the time-span for which a certain condition can be asserted may be shorter than the real time-span, for which this condition held.
The nature of that condition can be described using *P2 has type*. For example, the E3 Condition State "condition of the SS Great Britain between 22 September 1846 and 27 August 1847" can be characterized as E55 Type "wrecked".

Examples:

- the "Amber Room" in Tsarskoje Selo being completely reconstructed from summer 2003 until now
- the Peterhof Palace near Saint Petersburg being in ruins from 1944 – 1946
- the state of my turkey in the oven at 14:30 on 25 December, 2002 (*P2 has type: E55 Type* "still not cooked")

Properties**:**

P5 consists of (forms part of): E3 Condition State

E4 Period

Subclass of: E2 Temporal Entity
Superclass of: E5 Event

Scope note: This class comprises sets of coherent phenomena or cultural manifestations bounded in time and space.

It is the social or physical coherence of these phenomena that identify an E4 Period and not the associated spatio-temporal bounds. These bounds are a mere approximation of the actual process of growth, spread and retreat. Consequently, different periods can overlap and coexist in time and space, such as when a nomadic culture exists in the same area as a sedentary culture.

Typically this class is used to describe prehistoric or historic periods such as the "Neolithic Period", the "Ming Dynasty" or the "McCarthy Era". There are however no assumptions about the scale of the associated phenomena. In particular all events are seen as synthetic processes consisting of coherent phenomena. Therefore E4 Period is a superclass of E5 Event. For example, a modern clinical E67 Birth can be seen as both an atomic E5 Event and as an E4 Period that consists of multiple activities performed by multiple instances of E39 Actor.

Artistic style may be modeled as E4 Period. There are two different conceptualisations of 'style', defined either by physical features or by historical context. For example, "Impressionism" can be viewed as a period lasting from approximately 1870 to 1905 during which paintings with particular characteristics were produced by a group of artists that included (among others) Monet, Renoir, Pissarro, Sisley and Degas. Alternatively, it can be regarded as a style applicable to all paintings sharing the characteristics of the works produced by the Impressionist painters, regardless of historical context. The first interpretation is consistent with E4 Period, and the second defines morphological object types that fall under E55 Type.

Another specific case of an E4 Period is the set of activities and phenomena associated with a settlement, such as the populated period of Nineveh.

Examples:

- Jurassic
- European Bronze Age
- Italian Renaissance
- Thirty Years War
- Sturm und Drang
- Cubism

Properties**:**

P7 took place at (witnessed): E53 Place
P8 took place on or within (witnessed): E19 Physical Object
P9 consists of (forms part of): E4 Period
P10 falls within (contains): E4 Period
P132 overlaps with: E4 Period
P133 is separated from: E4 Period

E6 Destruction

Subclass of: E64 End of Existence

Scope note: This class comprises events that destroy one or more instances of E18 Physical Thing such that they lose their identity as the subjects of documentation.

Some destruction events are intentional, while others are independent of human activity. Intentional destruction may be documented by classifying the event as both an E6 Destruction and E7 Activity.

The decision to document an object as destroyed, transformed or modified is context sensitive:
1. If the matter remaining from the destruction is not documented, the event is modelled solely as E6 Destruction.
2. An event should also be documented using E81 Transformation if it results in the destruction of one or more objects and the simultaneous production of others using parts or material from the original. In this case, the new items have separate identities. Matter is preserved, but identity is not.
3. When the initial identity of the changed instance of E18 Physical Thing is preserved, the event should be documented as E11 Modification.

Examples:

- the destruction of Lisbon by earthquake in 1755
- the destruction of Nineveh (E6, E7)
- the breaking of a champagne glass yesterday by my dog
- the shooting of the last wolf ('Canis lupus Linne, 1758') of the Rhineland/Germany, in Birreskopf/Eifel 1860 (now Museum Alexander Koenig inventory no.: ZFMK 86.385) (E6, E7)

Properties:

P13 destroyed (was destroyed by): E18 Physical Thing

E7 Activity

Subclass of: E5 Event
Superclass of: E8 Acquisition
E9 Move
E10 Transfer of Custody
E11 Modification
E13 Attribute Assignment
E65 Creation
E66 Formation

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:

- the Battle of Stalingrad
- the Yalta Conference
- my birthday celebration 28-6-1995
- the writing of "Faust" by Goethe (E65)
- the formation of the Bauhaus 1919 (E66)

Properties:

P14 carried out by (performed): E39 Actor
(P14.1 in the role of: E55 Type)
P15 was influenced by (influenced): E1 CRM Entity
P16 used specific object (was used for): E70 Thing
(P16.1 mode of use: E55 Type)
P17 was motivated by (motivated): E1 CRM Entity

P19 was intended use of (was made for): E71 Man-Made Thing
(P19.1 mode of use: E55 Type)
P20 had specific purpose (was purpose of): E7 Activity
P21 had general purpose (was purpose of): E55 Type
P32 used general technique (was technique of): E55 Type
P33 used specific technique (was used by): E29 Design or Procedure
P125 used object of type (was type of object used in): E55 Type
P134 continued (was continued by): E7 Activity

E11 Modification

Subclass of: E7 Activity
Superclass of: E12 Production
E79 Part Addition
E80 Part Removal

Scope note: This class comprises all instances of E7 Activity that create, alter or change E24 Physical Man-Made Thing.

This class includes the production of an item from raw materials, and other so far undocumented objects, and the preventive treatment or restoration of an object for conservation.

Since the distinction between modification and production is not always clear, modification is regarded as the more generally applicable concept. This implies that some items may be consumed or destroyed in a Modification, and that others may be produced as a result of it. An event should also be documented using E81 Transformation if it results in the destruction of one or more objects and the simultaneous production of others using parts or material from the originals. In this case, the new items have separate identities.

If the instance of the E29 Design or Procedure utilised for the modification prescribes the use of specific materials, they should be documented using properties of the design or procedure, rather than via *P126 employed (was employed in): E57 Material*.

Examples:

- the construction of the SS Great Britain (E12)
- the impregnation of the Vasa warship in Stockholm for preservation after 1956
- the transformation of the Enola Gay into a museum exhibit by the National Air and Space Museum in Washington DC between 1993 and 1995 (E12, E81)
- the last renewal of the gold coating of the Toshogu shrine in Nikko, Japan

Properties:

P31 has modified (was modified by): E24 Physical Man-Made Thing
P126 employed (was employed in): E57 Material

E12 Production

Subclass of: E11 Modification
E63 Beginning of Existence

Scope note: This class comprises activities that are designed to, and succeed in, creating one or more new items.

It specializes the notion of modification into production. The decision as to whether or not an object is regarded as new is context sensitive. Normally, items are considered “new” if there is no obvious overall similarity between them and the consumed items and material used in their

production. In other cases, an item is considered “new” because it becomes relevant to documentation by a modification. For example, the scribbling of a name on a potsherd may make it a voting token. The original potsherd may not be worth documenting, in contrast to the inscribed one.

This entity can be collective: the printing of a thousand books, for example, would normally be considered a single event.

An event should also be documented using E81 Transformation if it results in the destruction of one or more objects and the simultaneous production of others using parts or material from the originals. In this case, the new items have separate identities and matter is preserved, but identity is not.

Examples:

- the construction of the SS Great Britain
- the recasting of the Little Mermaid at the harbour of Copenhagen
- the seventh edition of Rembrandt’s etching “Woman sitting half dressed beside a stove”, 1658, Bartsch Number 197

Properties:

P108 has produced (was produced by): E24 Physical Man-Made Thing

E13 Attribute Assignment

Subclass of: E7 Activity
Superclass of: E14 Condition Assessment
E15 Identifier Assignment
E16 Measurement
E17 Type Assignment

Scope note: This class comprises the actions of making assertions about properties of an object or any relation between two items or concepts.

This class allows the documentation of how the respective assignment came about, and whose opinion it was. All the attributes or properties assigned in such an action can also be seen as directly attached to the respective item or concept, possibly as a collection of contradictory values. All cases of properties in this model that are also described indirectly through an action are characterised as "short cuts" of this action. This redundant modelling of two alternative views is preferred because many implementations may have good reasons to model either the action or the short cut, and the relation between both alternatives can be captured by simple rules.

In particular, the class describes the actions of people making propositions and statements during certain museum procedures, e.g. the person and date when a condition statement was made, an identifier was assigned, the museum object was measured, etc. Which kinds of such assignments and statements need to be documented explicitly in structures of a schema rather than free text, depends on if this information should be accessible by structured queries.

Examples:

- the assessment of the current ownership of Martin Doerr’s silver cup in February 1997

Properties:

P140 assigned attribute to (was attributed by): E1 CRM Entity
P141 assigned (was assigned by): E1 CRM Entity

E15 Identifier Assignment

Subclass of: E13 Attribute Assignment

Scope note: This class comprises actions assigning or deassigning object identifiers.

Examples of such identifiers include Find Numbers and Inventory Numbers. Documenting the act of identifier assignment and deassignment is especially useful when objects change custody or the identification system of an organization is changed. In order to keep track of the identity of an object in such cases, it is important to document by whom, when and for what purpose an identifier is assigned to an object.

Examples:

- replacement of the inventory number TA959a by GE34604 for a 17th century lament cloth at the Museum Benaki, Athens

Properties**:**

P36 registered (was registered by): E19 Physical Object
P37 assigned (was assigned by): E42 Object Identifier
P38 deassigned (was deassigned by): E42 Object Identifier

E18 Physical Thing

Subclass of: E72 Legal Object
Superclass of: E19 Physical Object
E24 Physical Man-Made Thing
E26 Physical Feature

Scope Note: This class comprises all persistent physical items with a relatively stable form, man-made or natural.

Depending on the existence of natural boundaries of such things, the CRM distinguishes the instances of E19 Physical Object from instances of E26 Physical Feature, such as holes, rivers, pieces of land etc. Most instances of E19 Physical Object can be moved (if not too heavy), whereas features are integral to the surrounding matter.

The CRM is generally not concerned with amounts of matter in fluid or gaseous states.

Examples:

- the Cullinan Diamond (E19)
- the cave "Ideon Andron" in Crete (E26)
- the Mona Lisa (E22)

Properties**:**

P44 has condition (condition of): E3 Condition State
P45 consists of (is incorporated in): E57 Material
P46 is composed of (forms part of): E18 Physical Thing
P49 has former or current keeper (is former or current keeper of): E39 Actor
P50 has current keeper (is current keeper of): E39 Actor
P51 has former or current owner (is former or current owner of): E39 Actor
P52 has current owner (is current owner of): E39 Actor
P53 has former or current location (is former or current location of): E53 Place
P58 has section definition (defines section): E46 Section Definition
P59 has section (is located on or within): E53 Place

E21 Person

Subclass of: E20 Biological Object
E39 Actor

Scope note: This class comprises real persons who live or are assumed to have lived.

Legendary figures that may have existed, such as Ulysses and King Arthur, fall into this class if the documentation refers to them as historical figures. In cases where doubt exists as to whether several persons are in fact identical, multiple instances can be created and linked to indicate their relationship. The CRM does not propose a specific form to support reasoning about possible identity.

Examples:

- Tut-Ankh-Amun
- Nelson Mandela
-

E27 Site

Subclass of: E26 Physical Feature

Scope Note: This class comprises pieces of land or sea floor.

In contrast to the purely geometric notion of E53 Place, this class describes constellations of matter on the surface of the Earth or other celestial body, which can be represented by photographs, paintings and maps.

Instances of E27 Site are composed of relatively immobile material items and features in a particular configuration at a particular location.

Examples:

- the Amazon river basin
- Knossos
- the Apollo 11 landing site
- Heathrow Airport
- the submerged harbour of the Minoan settlement of Gournia, Crete

E28 Conceptual Object

Subclass of: E71 Man-Made Thing
Superclass of: E30 Right
E55 Type
E73 Information Object

Scope note: This class comprises non-material products of our minds and information produced by humans with or without using technical devices that have become objects of a discourse about their identity, circumstances of creation and historical implications.

Characteristically, instances of this class are created, invented or thought by someone, and then may be documented or communicated between persons. Instances of E28 Conceptual Object have the ability to exist on more than one particular carrier at the same time, such as papers, electronic signals, marks, audio media, paintings, photos, human memories, etc.

They cannot be destroyed as long as they exist on at least one carrier or in memory.
Their existence ends when the last carrier is lost. A greater distinction can be made between products having a clear identity, such as a specific text, or photographs, and the ideas and concepts shared and traded by groups of people.

Examples:

- Beethoven's "Ode an die Freude" (Ode to Joy), (E73)

- the definition of "ontology" in the Oxford English Dictionary
- the knowledge about the victory at Marathon carried by the famous runner

E29 Design or Procedure

Subclass of: E73 Information Object

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 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 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:

- the ISO standardisation procedure
- the musical notation for Beethoven's "Ode to Joy"
- the architectural drawings for the Kölner Dom in Cologne, Germany
- folio 860 of the Codex Atlanticus from Leonardo da Vinci, 1486-1490, kept in the Biblioteca Ambrosiana in Milan

Properties:

P68 usually employs (is usually employed by): E57 Material
P69 is associated with: E29 Design or Procedure

E30 Right

Subclass of: E28 Conceptual Object

Scope Note: This class comprises legal privileges concerning material and immaterial things or their derivatives.

These include reproduction and property rights.

Examples:

- copyright held by ISO on ISO/CD 21127
- ownership of the "Mona Lisa" by the Louvre

E33 Linguistic Object

Subclass of: E73 Information Object
Superclass of: E34 Inscription
E35 Title

Scope note: This class comprises identifiable expressions in natural language or languages.

Instances of E33 Linguistic Object can be expressed in many ways: e.g. as written texts, recorded speech or sign language. However, the CRM treats instances of E33 Linguistic Object independently from the medium or method by which they are expressed. Expressions in formal languages, such as computer code or mathematical formulae, are not treated as instances of E33 Linguistic Object by the CRM. These should be modelled as instances of E73 Information Object.

Examples:

- the text of the Ellesmere Chaucer manuscript
- the lyrics of the song "Blue Suede Shoes"
- the text of the Jabberwocky by Lewis Carroll
- the text of "Doktoro Jekyll kaj Sinjoro Hyde" (an Esperanto translation of Dr Jekyll and Mr Hyde)

Properties:

P72 has language (is language of): E56 Language
P73 has translation (is translation of): E33 Linguistic Object

E35 Title

Subclass of: E33 Linguistic Object
E41 Appellation

Scope note: This class comprises the names assigned to works, such as texts, artworks or pieces of music.

Titles are proper noun phrases or verbal phrases, and should not be confused with generic object names such as “chair”, “painting” or “book” (the latter are common nouns and are modelled in the CRM as instances of E55 Type). Titles may be assigned by the creator of the work itself, or by a social group.

This class also comprises the translations of titles that are used as surrogates for the original titles in different social contexts.

Examples:

- The Merchant of Venice
- Mona Lisa
- La Pie or The Magpie
- Lucy in the Sky with Diamonds

E37 Mark

Subclass of: E36 Visual Item
Superclass of: E34 Inscription

Scope note: This class comprises symbols, signs, signatures or short texts applied to instances of E24 Physical Man-Made Thing by arbitrary techniques in order to indicate the creator, owner, dedications, purpose, etc.

This class specifically excludes features that have no semantic significance, such as scratches or tool marks. These should be documented as instances of E25 Man-Made Feature.

Examples:

- Minoan double axe mark
- ©

- ☺

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 for which they can 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:

- London and Continental Railways (E40)
- the Governor of the Bank of England in 1975 (E21)
- Sir Ian McKellan (E21)

Properties:

P74 has current or former residence (is current or former residence of): E53 Place
P75 possesses (is possessed by): E30 Right
P76 has contact point (provides access to): E51 Contact Point
P131 is identified by (identifies): E82 Actor Appellation

E41 Appellation

Subclass of: E77 Persistent Item
Superclass of: E35 Title
E42 Object Identifier
E44 Place Appellation
E49 Time Appellation
E75 Conceptual Object Appellation
E82 Actor Appellation

Scope note: This class comprises all proper names, words, phrases or codes, either meaningful or not, that are used or can be used to identify a specific instance of some class within a certain context.

Instances of E41 Appellation do not identify objects by their meaning but by convention, tradition or agreement. From an implementation point of view, the class E41 Appellation is unlike most others, whose instances in a database can be considered as surrogates or references to real-world entities, in that each instance is nothing other than the E41 Appellation itself, i.e. the instance of E41 Appellation "Martin" is nothing other than the name "Martin" which should not be confused with any instance of E21 Person or persons called Martin.

Specific subclasses of E41 Appellation should be used when instances of E41 Appellation of a characteristic form are used for particular kinds of items. Instances of E49 Time Appellation, for example, which take the form of instances of E50 Date, can be easily recognised.

E41 Appellation should not be confused with the act of naming something. cf. E15 Identifier Assignment

Examples:

- Martin
- the Forth Bridge

- the Merchant of Venice (E35)

Properties:

P139 has alternative form: E41 Appellation

E42 Object Identifier

Subclass of: E41 Appellation

Scope note: This class comprises codes assigned to objects in order to identify them uniquely within the context of one or more organisations.

Such codes are often known as inventory numbers, registration codes, etc. and are typically composed of alphanumeric sequences. The class E42 Object Identifier is not normally used for machine-generated identifiers used for automated processing unless these are also used by human agents.

Examples:

- MM.GE.195
- 13.45.1976
- DPS_1000
- OXCMS: 1997.4.1

E44 Place Appellation

Subclass of: E41 Appellation
Superclass of E45 Address
E46 Section Definition
E47 Spatial Coordinates
E48 Place Name

Scope Note: This class comprises any sort of identifier characteristically used to refer to an E53 Place.

Instances of E44 Place Appellation may vary in their degree of precision and their meaning may vary over time - the same instance of E44 Place Appellation may be used to refer to several places, either because of cultural shifts, or because objects used as reference points have moved around. Instances of E44 Place Appellation can be extremely varied in form: postal addresses, instances of E47 Spatial Coordinate, and parts of buildings can all be considered as instances of E44 Place Appellation.

Examples:

- Vienna
- CH-1211, Genève
- Aquae Sulis Minerva
- Bath
- Cambridge
- the Other Place
- the City

E47 Spatial Coordinates

Subclass of: E44 Place Appellation

Scope Note: This class comprises the textual or numeric information required to locate specific instances of E53 Place within schemes of spatial identification.

Coordinates are a specific form of E44 Place Appellation, that is, a means of referring to a particular E53 Place. Coordinates are not restricted to longitude, latitude and altitude. Any regular system of reference that maps onto an E19 Physical Object can be used to generate coordinates.

Examples:

- 6°5'29"N 45°12'13"W
- Black queen's bishop 4 [chess coordinate]

E49 Time Appellation

Subclass of: E41 Appellation
Superclass of E50 Date

Scope Note: This class comprises all forms of names or codes, such as historical periods, and dates, which are characteristically used to refer to a specific E52 Time-Span.

The instances of E49 Time Appellation may vary in their degree of precision, and they may be relative to other time frames, "Before Christ" for example. Instances of E52 Time-Span are often defined by reference to a cultural period or an event e.g. 'the duration of the Ming Dynasty'.

Examples:

- Meiji [Japanese term for a specific time-span]
- 1st half of the XX century
- Quaternary
- 1215 Hegira [a date in the Islamic calendar]
- Last century

E50 Date

Subclass of: E49 Time Appellation

Scope Note: This class comprises specific forms of E49 Time Appellation.

Dates may vary in their degree of precision.

Examples:

- 1900
- 4-4-1959
- 19-MAR-1922
- 19640604

E52 Time-Span

Subclass of: E1 CRM Entity

Scope note: This class comprises abstract temporal extents, in the sense of Galilean physics, having a beginning, an end and a duration.

Time Span has no other semantic connotations. Time-Spans are used to define the temporal extent of instances of E4 Period, E5 Event and any other phenomena valid for a certain time. An E52 Time-Span may be identified by one or more instances of E49 Time Appellation.

Since our knowledge of history is imperfect, instances of E52 Time-Span can best be considered as approximations of the actual Time-Spans of temporal entities. The properties of E52 Time-Span are intended to allow these approximations to be expressed precisely. An extreme case of approximation, might, for example, define an E52 Time-Span having unknown beginning, end and duration. Used as a common E52 Time-Span for two events, it would nevertheless define them as being simultaneous, even if nothing else was known.

Automatic processing and querying of instances of E52 Time-Span is facilitated if data can be parsed into an E61 Time Primitive.

Examples:

- 1961
- From 12-17-1993 to 12-8-1996
- 14h30 – 16h22 4th July 1945
- 9.30 am 1.1.1999 to 2.00 pm 1.1.1999
- duration of the Ming Dynasty

Properties:

P78 is identified by (identifies): E49 Time Appellation
P79 beginning is qualified by: E62 String
P80 end is qualified by: E62 String
P81 ongoing throughout: E61 Time Primitive
P82 at some time within: E61 Time Primitive
P83 had at least duration (was minimum duration of): E54 Dimension
P84 had at most duration (was maximum duration of): E54 Dimension
P86 falls within (contains): E52 Time-Span

E53 Place

Subclass of: E1 CRM Entity

Scope note: This class comprises extents in space, in particular on the surface of the earth, in the pure sense of physics: independent from temporal phenomena and matter.

The instances of E53 Place are usually determined by reference to the position of "immobile" objects such as buildings, cities, mountains, rivers, or dedicated geodetic marks. A Place can be determined by combining a frame of reference and a location with respect to this frame. It may be identified by one or more instances of E44 Place Appellation.

It is sometimes argued that instances of E53 Place are best identified by global coordinates or absolute reference systems. However, relative references are often more relevant in the context of cultural documentation and tend to be more precise. In particular, we are often interested in position in relation to large, mobile objects, such as ships. For example, the Place at which Nelson died is known with reference to a large mobile object – H.M.S Victory. A resolution of this Place in terms of absolute coordinates would require knowledge of the movements of the vessel and the precise time of death, either of which may be revised, and the result would lack historical and cultural relevance.

Any object can serve as a frame of reference for E53 Place determination. The model foresees the notion of a "section" of an E19 Physical Object as a valid E53 Place determination.

Examples:

- the extent of the UK in the year 2003
- the position of the hallmark on the inside of my wedding ring

- the place referred to in the phrase: “Fish collected at three miles north of the confluence of the Arve and the Rhone”
- here -> <-

Properties:

P87 is identified by (identifies): E44 Place Appellation
P88 consists of (forms part of): E53 Place
P89 falls within (contains): E53 Place
P121 overlaps with: E53 Place
P122 borders with: E53 Place

E54 Dimension

Subclass of: E1 CRM Entity

Scope note: This class comprises quantifiable properties that are measured by some calibrated means and can be approximated by numerical values.

An instance of E54 Dimension is thought to be the true quantity, independent from its numerical approximation, e.g. in inches or in cm. The properties of the class E54 Dimension allow for expressing the numerical approximation. It is recommended to record all numerical approximations of instances of E54 Dimension as intervals of indeterminacy. Numerical approximations in archaic instances of E58 Measurement Unit used in historical records should be preserved. Equivalents corresponding to current knowledge should be recorded as additional instances of E54 Dimension as appropriate.

Examples:

- currency: £26.00
- length: 3.9-4.1 cm
- diameter 26 mm
- weight 150 lbs
- density: 0.85 gm/cc
- luminescence: 56 ISO lumens
- tin content: 0.46 %
- taille au garot: 5 hands
- calibrated C14 date: 2460-2720 years, etc

Properties:

P90 has value: E60 Number
P91 has unit (is unit of): E58 Measurement Unit

E55 Type

Subclass of: E28 Conceptual Object
Superclass of: E56 Language
E57 Material
E58 Measurement Unit

Scope note: This class comprises arbitrary concepts (universals) and provides a mechanism for organising them into a hierarchy.

This hierarchy is intended to duplicate the names of all the classes present in the model. This allows additional refinement, through subtyping, of those classes which do not require further analysis of their formal properties, but which nonetheless represent typological distinctions important to a given user group.

It should be noted that the Model does not make the distinction between classes and types known from some knowledge representation systems and object-oriented programming languages. The class E55 Type can be regarded as a metaclass (a class whose instances are universals), used to denote a user-defined specialization of some class or property of the Model, without introducing any additional formal properties for this specialization.

It reflects the characteristic use of the term "object type" for naming data fields in museum documentation and particularly the notion of typology in archaeology. It has however nothing to do with the term "type" in Natural History (cf. E83 Type Creation), but it includes the notion of a "taxon".

Ideally, instances of the class E55 Type should be organised into thesauri, with scope notes, illustrations, etc. to clarify their meaning. In general, it is expected that different domains and cultural groups will develop different thesauri in parallel. Consistent reasoning on the expansion of subterms used in a thesaurus is possible insofar as it conforms to both the classes and the hierarchies of the model.

E56 Language, E57 Material and E58 Measurement Unit have been defined explicitly as elements of the E55 Type hierarchy because they are used categorically in the model without reference to instances of them, i.e. the Model does not foresee the description of instances of instances of them, e.g., the property instance "*P45 consists of :* gold" does not refer to a particular instance of gold.

Examples:

- weight, length, depth [types of E54 Dimension]
- portrait, sketch, animation [types of E38 image]
- French, English, German [E56]
- excellent, good, poor [types of E3 Condition State]
- Ford Model T, chop stick [types of E22 Man-Made Object]
- cave, doline, scratch [types of E26 Physical Feature]
- poem, short story [types of E33 Linguistic Object]
- wedding, earthquake, skirmish [types of E5 Event]

Properties:

P127 has broader term (has narrower term): E55 Type
P137 is exemplified by (exemplifies): E1 CRM Entity
P137.1 in the taxonomic role: E55 Type

E57 Material

Subclass of: E55 Type

Scope note: This class is a specialization of E55 Type and comprises the concepts of materials.

Instances of E57 Material may denote properties of matter before its use, during its use, and as incorporated in an object, such as ultramarine powder, tempera paste, reinforced concrete. Discrete pieces of raw-materials kept in museums, such as bricks, sheets of fabric, pieces of metal, should be modelled individually in the same way as other objects. Discrete used or processed pieces, such as the stones from Nefer Titi's temple, should be modelled as parts (cf. *P46 is composed of*).

This type is used categorically in the model without reference to instances of it, i.e. the Model does not foresee the description of instances of instances of E57 Material, e.g.: "instances of gold".

It is recommended that internationally or nationally agreed codes and terminology are used.

Examples:

- brick
- gold
- aluminium
- polycarbonate
- resin
-

E60 Number

Subclass of: E59 Primitive Value

Scope Note: This class comprises any encoding of computable (algebraic) values such as integers, real numbers, complex numbers, vectors, tensors etc., including intervals of these values to express limited precision.

Numbers are fundamentally distinct from identifiers in continua, such as instances of E50 Date and E47 Spatial Coordinate, even though their encoding may be similar. Instances of E60 Number can be combined with each other in algebraic operations to yield other instances of E60 Number, e.g., 1+1=2. Identifiers in continua may be combined with numbers expressing distances to yield new identifiers, e.g., 1924-01-31 + 2 days = 1924-02-02. Cf. E54 Dimension

Examples:

- 5
- 3+2i
- 1.5e-04
- (0.5, - 0.7,88)

E61 Time Primitive

Subclass of: E59 Primitive Value

Scope Note: This class comprises instances of E59 Primitive Value for time that should be implemented with appropriate validation, precision and interval logic to express date ranges relevant to cultural documentation.

E61 Time Primitive is not further elaborated upon within the model.

Examples:

- 1994 – 1997
- 13 May 1768
- 2000/01/01 00:00:59.7
- 85th century BC

E62 String

Subclass of: E59 Primitive Value

Scope Note: This class comprises the instances of E59 Primitive Values used for documentation such as free text strings, bitmaps, vector graphics, etc.

E62 String is not further elaborated upon within the model

Examples:

- the Quick Brown Fox Jumps Over the Lazy Dog
- 6F 6E 54 79 70 31 0D 9E

E65 Creation

Subclass of: E7 Activity
E63 Beginning of Existence
Superclass of: E83 Type Creation

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:

- the framing of the U.S. Constitution
- the drafting of U.N. resolution 1441

Properties:

P94 has created (was created by): E28 Conceptual Object

E66 Formation

Subclass of: E7 Activity
E63 Beginning of Existence

Scope note: This class comprises events that result in the formation of a formal or informal E74 Group of people, such as a club, society, association, corporation or nation.

E66 Formation does not include the arbitrary aggregation of people who do not act as a collective.

Examples:

- the formation of the CIDOC CRM Special Interest Group
- the formation of the Soviet Union
- the conspiring of the murderers of Caesar

Properties:

P95 has formed (was formed by): E74 Group

E67 Birth

Subclass of: E63 Beginning of Existence

Scope note: This class comprises the birth of a human beings.

E67 Birth is a biological event focussing on the context of people coming into life.
(E63 Beginning of Existence comprises the coming into life of any living beings).

Twins, triplets etc. are brought into life by the same E67 Birth event. The introduction of the E67 Birth event as a documentation element allows the description of a range of family relationships in a simple model. Suitable extensions may describe more details and the complexity of motherhood with the intervention of modern medicine. In this model, the biological father is not seen as a necessary participant in the E67 Birth event.

Examples:

- the birth of Alexander the Great

Properties:

P96 by mother (gave birth): E21 Person
P97 from father (was father for): E21 Person
P98 brought into life (was born): E21 Person

E69 Death

Subclass of: E64 End of Existence

Scope note: This class comprises the deaths of human beings.

If a person is *killed*, their death should be instantiated as E69 Death and as E7 Activity. The death or perishing of other living beings should be documented using E64 End of Existence.

Examples:

- the murder of Julius Caesar (E69,E7)
- the death of Senator Paul Wellstone

Properties:

P100 was death of (died in): E21 Person

E72 Legal Object

Subclass of: E70 Thing
Superclass of: E18 Physical Thing
E73 Information Object

Scope note: This class comprises those material or immaterial items to which instances of E30 Right, such as the right of ownership or use, can be applied.

This is true for all E18 Physical Thing. In the case of instances of E28 Conceptual Object, however, the identity of the E28 Conceptual Object or the method of its use may be too ambiguous to reliably establish instances of E30 Right, as in the case of taxa and inspirations. Ownership of corporations is currently regarded as out of scope of the CRM.

Examples:

- the Cullinan diamond (E19)
- definition of the CIDOC Conceptual Reference Model Version 2.1 (E73)

Properties:

P104 is subject to (applies to): E30 Right
P105 right held by (has right on): E39 Actor

E73 Information Object

Subclass of: E28 Conceptual Object
E72 Legal Object
Superclass of: E29 Design or Procedure
E31 Document
E33 Linguistic Object
E36 Visual Item

Scope note: This class comprises identifiable immaterial items, such as a poems, jokes, data sets, images,

texts, multimedia objects, procedural prescriptions, computer program code, algorithm or mathematical formulae, that have an objectively recognizable structure and are documented as single units.

An E73 Information Object does not depend on a specific physical carrier, which can include human memory, and it can exist on one or more carriers simultaneously.
Instances of E73 Information Object of a linguistic nature should be declared as instances of the E33 Linguistic Object subclass. Instances of E73 Information Object of a documentary nature should be declared as instances of the E31 Document subclass. Conceptual items such as types and classes are not instances of E73 Information Object, nor are ideas without a reproducible expression.

Examples:

- image BM000038850.JPG from the Clayton Herbarium in London
- E. A. Poe's "The Raven"
- the movie "The Seven Samurai" by Akira Kurosawa
- the Maxwell Equations

Properties:

P67 refers to (is referred to by): E1 CRM Entity
(P67.1 has type: E55 Type)
P106 is composed of (forms part of): E73 Information Object
P129 is about (is subject of): E1 CRM Entity

E74 Group

Subclass of: E39 Actor
Superclass of: E40 Legal Body

Scope note: This class comprises any gatherings or organizations of two or more people that act collectively or in a similar way due to any form of unifying relationship.

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 modeled as membership in an E74 Group (cf. HumanML markup).

Examples:

- the impressionists
- the Navajo
- the Greeks
- the peace protestors in New York City on February 15 2003
- Exxon-Mobil

Properties:

P107 has current or former member (is current or former member of): E39 Actor

E75 Conceptual Object Appellation

Subclass of: E41 Appellation

Scope note: This class comprises all specific identifiers of intellectual products or standardized patterns.

Examples:

- ISBN 3-7913-1418-1
- ISO2788-1986 (E)

E82 Actor Appellation

Subclass of: E41 Appellation

Scope note: This class comprises any sort of name, number, code or symbol characteristically used to identify an E39 Actor.

An E39 Actor will typically have more than one E82 Actor Appellation, and instances of E82 Actor Appellation in turn may have alternative representations. The distinction between corporate and personal names, which is particularly important in library applications, should be made by explicitly linking the E82 Actor Appellation to an instance of either E21 Person or E74 Group/E40 Legal Body. If this is not possible, the distinction can be made through the use of the *P2 has type* mechanism.

Examples:

- John Doe
- Doe, J.
- the U.S. Social Security Number 246-14-2304
- the Artist Formerly Known as Prince
- the Master of the Flemish Madonna
- Raphael's Workshop
- the Brontë Sisters
- ICOM
- International Council of Museums

E84 Information Carrier

Subclass of: E22 Man-Made Object

Scope note: This class comprises all instances of E22 Man-Made Object that are explicitly designed to act as persistent physical carriers for instances of E73 Information Object.

This allows a relationship to be asserted between an E19 Physical Object and its immaterial information contents. An E84 Information Carrier may or may not contain information, e.g., a diskette. Note that any E18 Physical Thing may carry information, such as an E34 Inscription. However, unless it was specifically designed for this purpose, it is not an Information Carrier. Therefore the property *P128 carries (is carried by)* applies to E18 Physical Thing in general.

Examples:

- the Rosetta Stone
- my paperback copy of Crime & Punishment
- the computer disk at ICS-FORTH that stores the canonical Definition of the CIDOC CRM

Properties: R61 is reproduction of (has reproduction)

Referred CIDOC CRM Properties

In this chapter are described the properties of the CIDOC Conceptual Reference Model which are referred from ooFRBR Model.

P1 is identified by (identifies)

Domain: E1 CRM Entity
Range: E41 Appellation
Superproperty of: E19 Physical Object. P47 is identified by (identifies): E42 Object Identifier
E52 Time-Span. P78 is identified by (identifies): E49 Time Appellation
E53 Place. P87 is identified by (identifies): E44 Place Appellation
E71 Man-Made Thing. P102 has title (is title of): E35 Title
E39 Actor. P131 is identified by (identifies): E82 Actor Appellation
Quantification: many to many (0,n:0,n)

Scope note: 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:

- the capital of Italy (E53) *is identified by* Rome (E48)
- text 25014–32 (E33) *is identified by* "The Decline and Fall of the Roman Empire" (E35)

P2 has type (is type of)

Domain: E1 CRM Entity
Range: E55 Type
Quantification: many to many (0,n:0,n)

Scope note: 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:

- www.cidoc.icom.org (E51) *has type* URL (E55)

P3 has note

Domain: E1 CRM Entity
Range: E62 String
Superproperty of: E52 Time-Span. P79 beginning is qualified by: E62 String
E52 Time-Span. P80 end is qualified by: E62 String
Quantification: one to many (0,n:0,1)

Scope note: This property is a container for all informal descriptions about an object that cannot be expressed in terms of CRM constructs.

In particular it captures the characterisation of the item itself, its internal structures, appearance etc.
Like property *P2 has type (is type of)*, this property is a consequence of the restricted focus of the CRM. The aim is not to capture, in a structured form, everything that can be said about an item; indeed, the CRM formalism is not regarded as sufficient to express everything that can be said. Good practice requires use of distinct note fields for different aspects of a characterisation. The *P2 has type (is type of)* property of *P3 has note* allows differentiation of specific notes, e.g. "construction", "decoration" etc.
An item may have many notes, but a note is attached to a specific item.

Examples:

- coffee mug – OXCMS:1983.1.1 (E19) *has note* chipped at edge of handle (E62) *has type* Condition (E55)

Properties: **P3.1 has type: E55 Type**

P4 has time-span (is time-span of)

Domain: E2 Temporal Entity
Range: E52 Time-Span
Quantification: many to one, necessary, dependent (1,1:1,n)

Scope note: This property describes the temporal confinement of an instance of an E2 Temporal Entity.

The related E52 Time-Span is understood as the real Time-Span during which the phenomena were active, which make up the temporal entity instance. It does not convey any other meaning than a positioning on the "time-line" of chronology. The Time-Span in turn is approximated by a set of dates (E61 Time Primitive). A temporal entity can have in reality only one Time-Span, but there may exist alternative opinions about it, which we would express by assigning multiple Time-Spans. Related temporal entities may share a Time-Span. Time-Spans may have completely unknown dates but other descriptions by which we can infer knowledge.

Examples:

- the Yalta Conference (E7) *has time-span* Yalta Conference time-span (E52), *ongoing throughout* 11 February 1945 (E61)

P7 took place at (witnessed)

Domain: E4 Period
Range: E53 Place
Superproperty of: E9 Move. P26 moved to (was destination of): E53 Place
E9 Move. P27 moved from (was origin of): E53 Place
Quantification: many to many, necessary (1,n:0,n)

Scope note: This property describes the spatial location of an instance of E4 Period.

The related E53 Place should be seen as an approximation of the geographical area within which the phenomena that characterise the period in question occurred. *P7took place at*

(witnessed) does not convey any meaning other than spatial positioning (generally on the surface of the earth). For example, the period "Révolution française" can be said to have taken place in "France", the "Victorian" period, may be said to have taken place in "Britain" and its colonies, as well as other parts of Europe and north America.
A period can take place at multiple locations.

Examples:

- the period "Révolution française" (E4) *took place at* France (E53)

P12 occurred in the presence of (was present at)

Domain: E5 Event
Range: E77 Persistent Item
Superproperty of: E5 Event. P11 had participant (participated in): E39 Actor
E7 Activity. P16 used specific object (was used for): E70 Thing
E9 Move. P25 moved (moved by): E19 Physical Object
E11 Modification. P31 has modified (was modified by): E24 Physical Man-Made Thing
E11 Modification. P33 used specific technique (was used by): E29 Design or Procedure
E63 Beginning of Existence. P92 brought into existence (was brought into existence by): E77 Persistent Item
E64 End of Existence. P93 took out of existence (was taken out of existence by): E77 Persistent Item
Quantification: many to many, necessary (1,n:0,n)

Scope note: This property describes the active or passive presence of an E77 Persistent Item in an E5 Event without implying any specific role.

It connects the history of a thing with the E53 Place and E50 Date of an event. For example, an object may be the desk, now in a museum on which a treaty was signed. The presence of an immaterial thing implies the presence of at least one of its carriers.

Examples:

- Deckchair 42 (E19) *was present at* The sinking of the Titanic (E5)

P13 destroyed (was destroyed by)

Domain: E6 Destruction
Range: E18 Physical Thing
Subproperty of: E64 End of Existence. P93 took out of existence (was taken out of existence by): E77 Persistent Item
Quantification: one to many, necessary (1,n:0,1)

Scope note: This property allows specific instances of E18 Physical Thing that have been destroyed to be related to a destruction event.
Destruction implies the end of an item's life as a subject of cultural documentation – the physical matter of which the item was composed may in fact continue to exist. A destruction event may be contiguous with a Production that brings into existence a derived object composed partly of matter from the destroyed object.

Examples:

- the Tay Bridge Disaster (E6) *destroyed* The Tay Bridge (E22)

P14 carried out by (performed)

Domain: E7 Activity
Range: E39 Actor
Subproperty of: E5 Event. P11 had participant (participated in): E39 Actor
Superproperty of: E8 Acquisition. P22 transferred title to (acquired title through): E39 Actor

E8 Acquisition. P23 transferred title from (surrendered title through): E39 Actor
E10 Transfer of Custody. P28 custody surrendered by (surrendered custody through): E39 Actor
E10 Transfer of Custody. P29 custody received by (received custody through): E39 Actor
Quantification: many to many, necessary (1,n:0,n)

Scope note: 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:

- the painting of the Sistine Chapel (E7) was *carried out by* Michaelangelo Buonaroti (E21) *in the role of* master craftsman (E55)

Properties: **P14.1 in the role of: E55 Type**

P31 has modified (was modified by)

Domain: E11 Modification
Range: E24 Physical Man-Made Thing
Subproperty of: E5 Event. P12 occurred in the presence of (was present at): E77 Persistent Item
Superproperty of: E12 Production. P108 has produced (was produced by): E24 Physical Man-Made Thing
E79 Part Addition. P110 augmented (was augmented by): E24 Physical Man-Made Thing
E80 Part Removal. P112 diminished (was diminished by): E24 Physical Man-Made Thing
Quantification: many to many, necessary (1,n:0,n)

Scope note: This property identifies the E24 Physical Man-Made Thing modified in an E11 Modification.

If a modification is applied to a non-man-made object, it is regarded as an E22 Man-Made Object from that time onwards.

Examples:

- rebuilding of the Reichstag (E11) *has modified* the Reichstag in Berlin (E24)

P43 has dimension (is dimension of)

Domain: E70 Thing
Range: E54 Dimension
Quantification: one to many, dependent (0,n:1.1)

Scope note: This property records a E54 Dimension of some E70 Thing.

It is a shortcut of the more fully developed path from E70 Thing through *P39 measured (was measured by)*, E16 Measurement *P40 observed dimension (was observed in)* to E54 Dimension. It offers no information about how and when an E54 Dimension was established, nor by whom.

An instance of E54 Dimension is specific to an instance of E70 Thing.

Examples:

- silver cup 232 (E22) *has dimension* height of silver cup 232 (E54) *has unit* mm (E58), *has value* 224 (E60)

P44 has condition (condition of)

Domain: E18 Physical Thing
Range: E3 Condition State
Quantification: one to many, dependent (0,n:1,1)

Scope note: This property records an E3 Condition State for some E18 Physical Thing.

It is a shortcut of the more fully developed path from E18 Physical Thing through *P34 concerned (was assessed by)*, E14 Condition Assessment *P35 has identified (identified by)* to E3 Condition State. It offers no information about how and when the E3 Condition State was established, nor by whom.

An instance of Condition State is specific to an instance of Physical Thing.

Examples:

- silver cup 232 (E22) *has condition* oxidation traces were present in 1997 (E3) *has type* oxidation traces (E55)

P45 consists of (is incorporated in)

Domain: E18 Physical Thing
Range: E57 Material
Quantification: many to many, necessary (1,n:0,n)

Scope note: This property identifies the instances of E57 Materials of which an instance of E18 Physical Thing is composed.

All physical things consist of physical materials. *P45 consists of (is incorporated in)* allows the different Materials to be recorded. *P45 consists of (is incorporated in)* refers here to observed Material as opposed to the consumed raw material.

A Material, such as a theoretical alloy, may not have any physical instances.

Examples:

- silver cup 232 (E22) *consists of* silver (E57)

P46 is composed of (forms part of)

Domain: E18 Physical Thing
Range: E18 Physical Thing
Quantification: many to many (0,n:0,n)

Scope note: This property allows instances of E18 Physical Thing to be analysed into component elements.

Component elements, since they are themselves instances of E18 Physical Thing, may be further analysed into sub-components, thereby creating a hierarchy of part decomposition. An instance of E18 Physical Thing may be shared between multiple wholes, for example two buildings may share a common wall.

This property is intended to describe specific components that are individually documented, rather than general aspects. Overall descriptions of the structure of an instance of E18 Physical Thing are captured by the *P3 has note* property.

The instances of E57 Materials of which an item of E18 Physical Thing is composed should be documented using *P45 consists of (is incorporated in)*.

Examples:

- the Royal carriage (E22) *forms part of* the Royal train (E22)

- the “Hog’s Back” (E24) *forms part of* the “Fosseway” (E24

P47 is identified by (identifies)

Domain: E19 Physical Object
Range: E42 Object Identifier
Subproperty of: E1 CRM Entity. P1 is identified by (identifies): E41 Appellation
Superproperty of: E19 Physical Object. P48 has preferred identifier (is preferred identifier of): E42 Object Identifier
Quantification: many to many (0,n:0,n)

Scope note: This property records the E42 Object Identifier used for a particular instance of E19 Physical Object.

It is intended primarily for museum identification numbers, such as object numbers, inventory numbers, registration numbers or accession* numbers. * (Note that the identification of the E8 Acquisition is sometimes mistaken for the identification of the acquired objects themselves).

P47 is identified by (identifies) is a sub-property of *P1 is identified by (identifies)*. The range of *P47 is identified by (identifies)* is restricted to E42 Object Identifier.
The property is a shortcut that associates an E42 Object Identifier directly with an object. It says nothing about when and where an E42 Object Identifier was assigned, nor by whom.

A more detailed representation can be made using the fully developed (i.e. indirect) path from E19 Physical Object through *P36 registered (was registered by)*, E15 Identifier Assignment, *P37 assigned (was assigned by)* to E42 Object Identifier.

Examples:

- the silver cup donated by Martin Doerr (E22) *is identified by* object number OXCMS:2001.1.32 (E42)

P49 has former or current keeper (is former or current keeper of)

Domain: E18 Physical Thing
Range: E39 Actor
Superproperty of: E18 Physical Thing. P50 has current keeper (is current keeper of): E39 Actor
Quantification: many to many (0,n:0,n)

Scope note: This property identifies the E39 Actor or Actors who have or have had custody of an instance of E18 Physical Thing at some time.

The distinction with *P50 has current keeper (is current keeper of)* is that *P49 has former or current keeper (is former or current keeper of)* leaves open the question as to whether the specified keepers are current.

P49 has former or current keeper (is former or current keeper of) is a shortcut for the more detailed path from E18 Physical Thing through *P30 transferred custody of (custody transferred through)*, E10 Transfer of Custody, *P28 custody surrendered by (surrendered custody through)* or *P29 custody received by (received custody through)* to E39 Actor.

Examples:

- paintings from The Iveagh Bequest (E18) *has former or current keeper* Secure Deliveries Inc. (E40)

P50 has current keeper (is current keeper of)

Domain: E18 Physical Thing

Range: E39 Actor
Subproperty of: E18 Physical Thing. P49 has former or current keeper (is former or current keeper of): E39 Actor
Quantification: many to many (0,n:0,n)

Scope note: This property identifies the E39 Actor or Actors who had custody of an instance of E18 Physical Thing at the time this property was recorded.

P50 has current keeper (is current keeper of) is a shortcut for the more detailed path from E18 Physical Thing through *P30 transferred custody of (custody transferred through)*, E10 Transfer of Custody, *P29 custody received by (received custody through)* to E39 Actor.

Examples:

- paintings from The Iveagh Bequest (E18) *has current keeper* The National Gallery (E40)

P51 has former or current owner (is former or current owner of)

Domain: E18 Physical Thing
Range: E39 Actor
Superproperty of: E18 Physical Thing. P52 has current owner (is current owner of): E39 Actor
Quantification: many to many (0,n:0,n)

Scope note: This property identifies the E39 Actor that is or has been the legal owner (i.e. title holder) of an instance of E18 Physical Thing at some time.

The distinction with *P52 has current owner (is current owner of)* is that *P51 has former or current owner (is former or current owner of)* does not indicate whether the specified owners are current. *P51 has former or current owner (is former or current owner of)* is a shortcut for the more detailed path from E18 Physical Thing through *P24 transferred title of (changed ownership through)*, E8 Acquisition, *P23 transferred title from (surrendered title through)*, or *P22 transferred title to (acquired title through)* to E39 Actor.

Examples:

- paintings from the Iveagh Bequest (E18) *has former or current owner* Lord Iveagh (E21)

P57 has number of parts

Domain: E19 Physical Object
Range: E60 Number
Quantification: many to one (0,1:0,n)

Scope note: This property documents the E60 Number of parts of which an instance of E19 Physical Object is composed.

This may be used as a method of checking inventory counts with regard to aggregate or collective objects. What constitutes a part or component depends on the context and requirements of the documentation. Normally, the parts documented in this way would not be considered as worthy of individual attention.

For a more complete description, objects may be decomposed into their components and constituents using *P46 is composed of (forms parts of)* and *P45 consists of (is incorporated in)*. This allows each element to be described individually.

Examples:

- chess set 233 (E22) *has number of parts* 33 (E60)

P65 shows visual item (is shown by)

Domain: E24 Physical Man-Made Thing
Range: E36 Visual Item
Subproperty of: E24 Physical Man-Made Thing. P128 carries (is carried by): E73 Information Object
Quantification: many to many (0,n:0,n)

Scope note: This property documents an E36 Visual Item shown by an instance of E24 Physical Man-Made Thing.

This property is similar to *P62 depicts (is depicted by)* in that it associates an item of E24 Physical Man-Made Thing with a visual representation. However, *P65 shows visual item (is shown by)* differs from the *P62 depicts (is depicted by)* property in that it makes no claims about what the E36 Visual Item is deemed to represent. E36 Visual Item identifies a recognisable image or visual symbol, regardless of what this image may or may not represent.

For example, all recent British coins bear a portrait of Queen Elizabeth II, a fact that is correctly documented using *P62 depicts (is depicted by)*. Different portraits have been used at different periods, however. *P65 shows visual item (is shown by)* can be used to refer to a particular portrait.
P65 shows visual item (is shown by) may also be used for Visual Items such as signs, marks and symbols, for example the 'Maltese Cross' or the 'copyright symbol' that have no particular representational content.

This property is part of the fully developed path from E24 Physical Man-Made Thing through *P65 shows visual item (is shown by)*, E36 Visual Item, *P138 represents (has representation)* to E1 CRM Entity which is shortcut by, *P62 depicts (is depicted by)*.

Examples:

- "Impression Sunrise" by Monet (E84) *shows visual item* Impression_Sunrise.jpg (E38)

P72 has language (is language of)

Domain: E33 Linguistic Object
Range: E56 Language
Quantification: many to many, necessary (0,n:0,n)

Scope note: This property describes the E56 Language of an E33 Linguistic Object.

Linguistic Objects are composed in one or more human Languages. This property allows these languages to be documented.

Examples:

- the American Declaration of Independence (E33*) has language* 18th Century English (E56)

P74 has current or former residence (is current or former residence of)

Domain: E39 Actor
Range: E53 Place
Quantification: many to many (0,n:0,n)

Scope note: This property describes the current or former E53 Place of residence of an E39 Actor.

The residence may be either the Place where the Actor resides, or a legally registered address of any kind.

Examples:

- Queen Elizabeth II (E39) *has current or former residence* Buckingham Palace (E53)

P75 possesses (is possessed by)

Domain: E39 Actor
Range: E30 Right
Quantification: many to many (0,n:0,n)

Scope note: This property identifies former or current instances of E30 Rights held by an E39 Actor.

Examples:

- Michael Jackson (E21) *possesses* Intellectual property rights on the Beatles' back catalogue (E30)

P78 is identified by (identifies)

Domain: E52 Time-Span
Range: E49 Time Appellation
Subproperty of: E1 CRM Entity. P1 is identified by (identifies): E41 Appellation
Quantification: many to many (0,n:0,n)

Scope note: This property identifies an E52 Time-Span using an E49Time Appellation.

Examples:

- the time span 1926 to 1988 (E52) *is identified by* Showa (Japanese time appellation) (E49)

P82 at some time within

Domain: E52 Time-Span
Range: E61 Time Primitive
Quantification: many to one, necessary (1,1:0,n)

Scope note: This property describes the maximum period of time within which an E52 Time-Span falls.

Since Time-Spans may not have precisely known temporal extents, the CRM supports statements about the minimum and maximum temporal extents of Time-Spans. This property allows a Time-Span's maximum temporal extent (i.e. it's outer boundary) to be assigned an E61 Time Primitive value. Time Primitives are treated by the CRM as application or system specific date intervals, and are not further analysed.

Examples:

- the time-span of the development of the CIDOC CRM (E52) *at some time within* 1992-infinity (E61)

P87 is identified by (identifies)

Domain: E53 Place
Range: E44 Place Appellation
Subproperty of: E1 CRM Entity. P1 is identified by (identifies): E41 Appellation
Quantification: many to many (0,n:0,n)

Scope note: This property identifies an E53 Place using an E44 Place Appellation.

Examples of Place Appellations used to identify Places include instances of E48 Place Name, addresses, E47 Spatial Coordinates etc.

Examples:

- the location of the Duke of Wellington's House (E53) *is identified by* No 1 London (E45)

P94 has created (was created by)

Domain: E65 Creation
Range: E28 Conceptual Object
Subproperty of: E63 Beginning of Existence. P92 brought into existence (was brought into existence by): E77 Persistent Item
Superproperty of: E83 Type Creation. P135 created type (was created by): E55 Type
Quantification: one to many, necessary, dependent (1,n:1,1)

Scope note: This property allows a conceptual E65 Creation to be linked to the E28 Conceptual Object created by it.

It represents the act of conceiving the intellectual content of the E28 Conceptual Object. It does not represent the act of creating the first physical carrier of the E28 Conceptual Object. As an example, this is the composition of a poem, not its commitment to paper.

Examples:

- the composition of "The Four Friends" by A. A. Milne (E65) *has created* "The Four Friends" by A. A. Milne (E28)

P95 has formed (was formed by)

Domain: E66 Formation
Range: E74 Group
Subproperty of: E63 Beginning of Existence. P92 brought into existence (was brought into existence by): E77 Persistent Item
Quantification: one to many, necessary, dependent (1,n:1,1)

Scope note: This property links the founding or E66 Formation for an E74 Group with the Group itself.

Examples:

- the formation of the CIDOC CRM SIG at the August 2000 CIDOC Board meeting (E66) *has formed* the CIDOC CRM Special Interest Group (E74)

P98 brought into life (was born)

Domain: E67 Birth
Range: E21 Person
Subproperty of: E63 Beginning of Existence. P92 brought into existence (was brought into existence by): E77 Persistent Item
Quantification: one to many, dependent (0,n:1,1)

Scope note: This property links an E67Birth event to an E21 Person in the role of offspring.

Twins, triplets etc. are brought into life by the same Birth event. This is not intended for use with general Natural History material, only people. There is no explicit method for modelling conception and gestation except by using extensions.

Examples:

- the Birth of Queen Elizabeth II (E67) *brought into life* Queen Elizabeth II (E21)

P100 was death of (died in)

Domain: E69 Death
Range: E21 Person
Subproperty of: E64 End of Existence. P93 took out of existence (was taken out of existence by): E77 Persistent Item
Quantification: one to many, necessary (1,n:0,n)

Scope note: This property links an E69 Death event to the E21 Person that died.

A Death event may involve multiple people, for example in the case of a battle or disaster. This is not intended for use with general Natural History material, only people.

Examples:

- Mozart's death (E69) *was death of* Mozart (E21)

P102 has title (is title of)

Domain: E71 Man-Made Thing
Range: E35 Title
Subproperty of: E1 CRM Entity. P1 is identified by (identifies): E41 Appellation
Quantification: many to many (0,n:0,n)

Scope note: This property describes the E35 Title applied to an instance of E71 Man-Made Thing. The E55 Type of Title is assigned in a sub property.

The *P102.1 has type* property of the *P102 has title (is title of)* property enables the relationship between the Title and the thing to be further clarified, for example, if the Title was a given Title, a supplied Title etc.
It allows any man-made material or immaterial thing to be given a Title. It is possible to imagine a Title being created without a specific object in mind.

Examples:

- the first book of the Old Testament (E33) *has title* "Genesis" (E35)
  has type translated (E55)

Properties: **P102.1 has type: E55 Type**

P103 was intended for (was intention of)

Domain: E71 Man-Made Thing
Range: E55 Type
Quantification: many to many (0,n:0,n)

Scope note: This property links an instance of E71 Man-Made Thing to an E55 Type of usage.

It creates a property between specific man-made things, both physical and immaterial, to Types of intended methods and techniques of use. Note: A link between specific man-made things and a specific use activity should be expressed using *P19 was intended use of (was made for).*

Examples:

- this plate (E22) *was intended for* being destroyed at wedding reception (E55)

P104 is subject to (applies to)

Domain: E72 Legal Object
Range: E30 Right

Quantification: many to many (0,n:0,n)

Scope note: This property links a particular E72 Legal Object to the instances of E30 Right to which it is subject.

The Right is held by an E39 Actor as described by *P75 possesses (is possessed by)*.

Examples:

- Beatles back catalogue (E72) *is subject to* reproduction right on Beatles back catalogue (E30)

P105 right held by (has right on)

Domain: E72 Legal Object
Range: E39 Actor
Quantification: many to many (0,n:0,n)

Scope note: This property identifies the E39 Actor who holds the instances of E30 Right to an E72 Legal Object.

P105 right held by (has right on) is a shortcut of the fully developed path from E72 Legal Object through *P104 is subject to 9applies to)*, E30 Right, *P75 possesses (is possessed by)* to E39 Actor.

Examples:

- Beatles back catalogue (E73) *right held by* Michael Jackson (E21)

P106 is composed of (forms part of)

Domain: E73 Information Object
Range: E73 Information Object
Quantification: many to many (0,n:0,n)

Scope note: This property links an E73 Information Object to another E73 Information Object in a part/whole relationship.

It allows for the decomposition of an Information Object into component parts, and hence the creation of a nested hierarchy of Information Objects

Examples:

- "the love song of J. Alfred Prufrock" (E33) *forms part of* The Works of T.S. Eliot. (E33)

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

Domain: E7 Activity
Range: E55 Type
Quantification: many to many (0,n:0,n)

Scope note: 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:

- at the Battle of Agincourt (E7), the English archers *used object of type* long bow (E55)

P129 is about (is subject of)

Domain: E73 Information Object
Range: E1 CRM Entity
Subproperty: E73 Information Object. P67 refers to (is referred to by): E1 CRM Entity
Quantification: many to many (0,n:0,n)

Scope note: This property identifies a E1 CRM Entity that is the subject of an E73 Information Object, in the sense of "aboutness" used in library science.

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 the E73 Information Object.

Examples:

- reach for the Sky (E73) *is about* Douglas Bader (E39)

P131 is identified by (identifies)

Domain: E39 Actor
Range: E82 Actor Appellation
Subproperty: E1 CRM Entity. P1 is identified by (identifies): E41 Appellation
Quantification: many to many (0,n:0,n)

Scope note: This property identifies a name used specifically to identify an E39 Actor.

This property is a specialisation of *P1 is identified by (identifies)* is identified by.

Examples:

- Tyler Withersopp IV (E39) *is identified by* US social security number 619-17-4204 (E82)

P138 represents (has representation)

Domain: E36 Visual Item
Range: E1 CRM Entity
Subproperty: E73 Information Object. P67 refers to (is referred to by): E1 CRM Entity
Quantification: many to many (0,n:0,n)

Scope note: This property establishes the relationship between an E36 Visual Item and the entity that it visually represents.

Any entity may be represented visually. This property is part of the fully developed path from E24 Physical Man-Made Thing through *P65 shows visual item (is shown by)*, E36 Visual Item, *P138 represents (has representation)* to E1 CRM Entity, which is shortcut by *P62depicts (is depicted by)*. *P138.1 mode of representation* allows the nature of the representation to be refined.

Examples:

- the design on the reverse of a Swiss coin (E36) *represents* Helvetia (E28)
  mode of representation Profile (E55)

Properties: P138.1 mode of representation: E55 Type