

## "Fanny och Alexander": A FRBR Modelling Exercise

28-Jul-2008 Detlev Balzer

*FRBR has been developed with a focus on materials as they occur in a library environment. A strict interpretation of FRBR as a model for filmographic information will lead to conflicts that can be resolved by introducing a few further definitions and refinements.*

This is an example of a FRBR<sub>ER</sub> interpretation towards the representation of moving images. It draws upon an example supplied to TC 372 by Elisabeth Giuliani in June, 2008 (N0150). The current modelling approach introduces the following definitions:

- Superordinate group 1 entities can only have properties that remain unchanged in instances of all subordinate group 1 entities.
- An instance of a group 1 entity can be associated with multiple instances of the immediately superordinate group 1 entity.

Properties of the *Work* entity are therefore restricted to those that are conferred by the event in which the work was created and that are inherited by all instances of dependent *Expressions*. This is consistent with the FRBR<sub>ER</sub> definition of *Work*, which states:

"We recognize the *work* through individual realizations or *expressions* of the *work*, but the *work* itself exists only in the commonality of content between and among the various *expressions* of the *work*."<sup>1</sup>

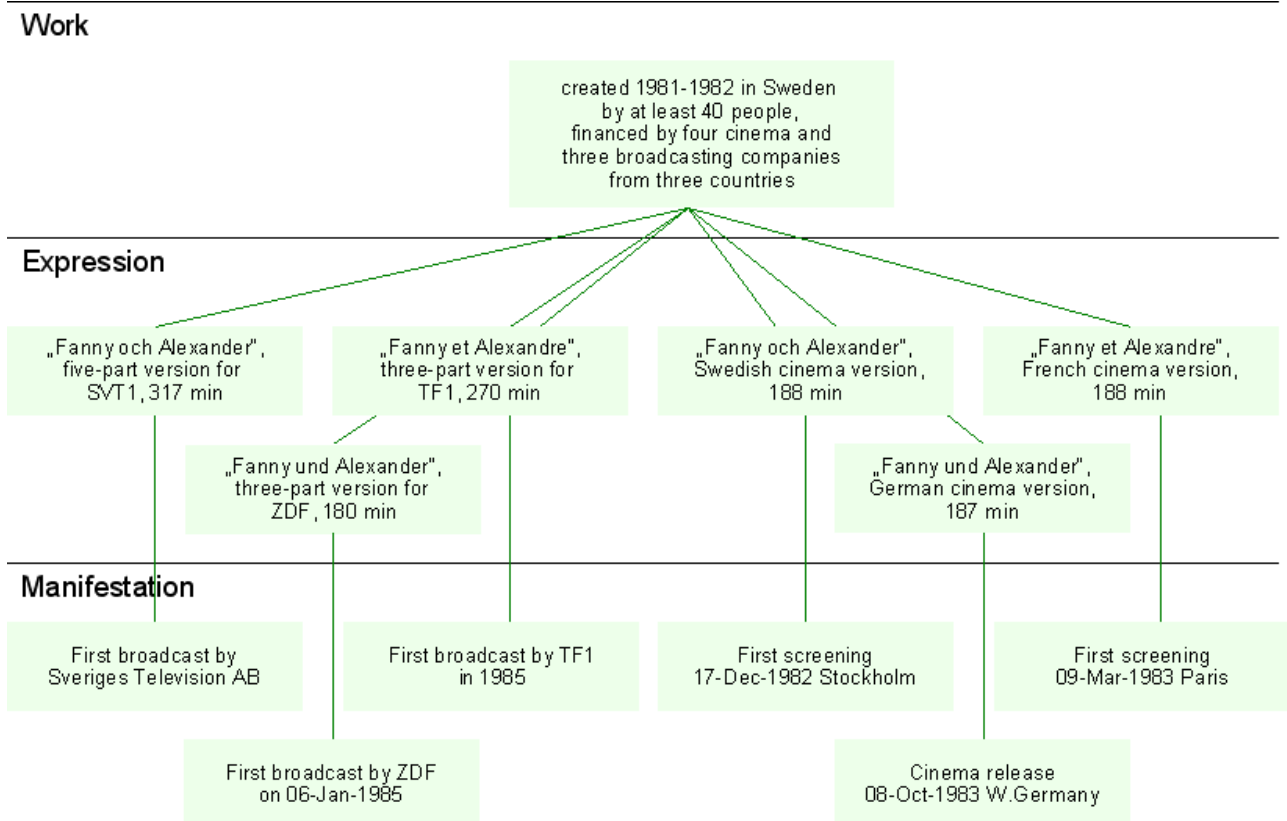


Fig. 1: *Fanny och Alexander* as a single work with some known expressions and some of their known manifestations.

1 Cf. section 3.2.1 in <http://www.ifla.org/VII/s13/frbr/frbr.pdf>

In Fig. 1, the instance of *Work* is primarily defined through the act of creation. In this respect it is similar to the *F28 Expression Creation* class from FRBR<sub>OO</sub><sup>2</sup>. Translating this into a FRBR<sub>OO</sub> property path, we get

F1 Work - R19 was realized through - F28 Expression Creation - R17 created - F2 Expression

where the F28 Expression Creation event is the link between *Work* and *Expression*. In FRBR<sub>ER</sub>, we have distinct agent relationships for *Work* and *Expression*:

Work - is created by - Person/Corporate Body

Expression - is realized by - Person/Corporate Body

Most users of filmographic information systems would not see any problems in associating Ingmar Bergman with Fanny och Alexander as the creator of the *Work*, since he is also credited with authorship of the screenplay. The dozens of other persons taking part in creating the primary expression of the film, however, would have to be associated with the *Expression* entity. Thus, each individual instance of *Expression* would have to carry the full number of cast and credits associations. In a recent note from AFNOR to the Joint Steering Committee for Development of RDA<sup>3</sup>, this has been identified as a potential source of practical problems:

"Always speaking in terms of authority records: if it is assumed that the levels work and expression cannot be mixed up within the same authority record, would that lead to a multiplication of dedicated authority records, as appear to indicate examples E and F (p. 21-22): i.e. one authority record for the work and as much authority records for the expressions of this work as needed? If the expression level is intended to give birth to separate authority records, the cataloguing treatments would be very heavy. A distinct authority record for a sound recording would be justified in cases of subject matter entry about that record. But if the sound recording is the recording of a version, the performers should be mentioned. For the time being they are recorded in the bibliographic record and no authority record is made at that level."

## **What are the alternatives?**

It can be argued that a screenplay, storyboard, or other pre-production artifact should be viewed as the true instance of a FRBR *Work* entity, from which the audio-visual expressions originate. This, however, would conflict with the observation that many cinematographic works (in particular, most documentaries, news items, and some other artistic genres) are created without reference to a pre-existing non-film work.

The work/expression nature of cinematographic works has been subject to some discussion and some authors do not see any obstacles when applying the FRBR *Work* definition to audiovisual creations:

"Clearly, the FRBR definition of work is in line with the definition of work followed by film catalogers, according to which a filmed version of a previously existing work intended for performance, for example, Shakespeare's *Romeo and Juliet*, is a new work related to the play, not an edition or expression of the play."<sup>4</sup>

---

2 FRBR object-oriented definition and mapping to FRBR<sub>ER</sub> (version 0.9 draft, January 2008).  
[http://www.ifla.org/VII/s13/wgfrbr/FRBRoo\\_V9.1\\_PR.pdf](http://www.ifla.org/VII/s13/wgfrbr/FRBRoo_V9.1_PR.pdf)

3 AFNOR CG 46/CN357/GE6: French Comments about RDA, sections 2-4, 9. March 2008, p. 4.  
<http://www.collectionscanada.gc.ca/jsc/docs/5rda-sec2349-chairfolup4.pdf>

4 Yee, Martha M.: Understanding FRBR. Chapter 11, FRBR and Moving Image Materials: Content (Work and Expression) versus Carrier (Manifestation). University of California Postprints (2007) Paper 2648.  
<http://repositories.cdlib.org/postprints/2648/>

Unfortunately, this discussion does not touch upon the multitude of information (particularly, agent relationships) that may be associated with the event of creating a moving image work. It is this event that sets audiovisual creations apart from the abstract (i.e. unembodied) nature demanded by the FRBR definition of *Work*.

Recognising that the lifecycle of a cinematographic work always begins with the creation of an audiovisual expression, we are faced with the decision of how to relate different versions to each other. In classical scholarship, the concept of *editio princeps* has been used to designate the first manifestation (and thus, expression) of a work, against which all subsequent editions can be compared. Turning this into a data model, we would have to distinguish between a primary expression and any number of secondary expressions. In practice, determining the primary expression of a cinematographic work is often impossible. In the case of *Fanny och Alexander*, the Swedish TV version may or may not be regarded as the primary expression. Even if it were known that the Swedish cinema version is based on the Swedish TV version, the question remains as to whether the French cinema version is based on the French TV version, on the Swedish cinema version, or on anything else. Since there are thousands of feature films that have been produced both for cinema and TV distribution, and a significant number of these are multinational productions, there are many cases in which the concept of an *editio princeps* cannot be applied in a meaningful way.

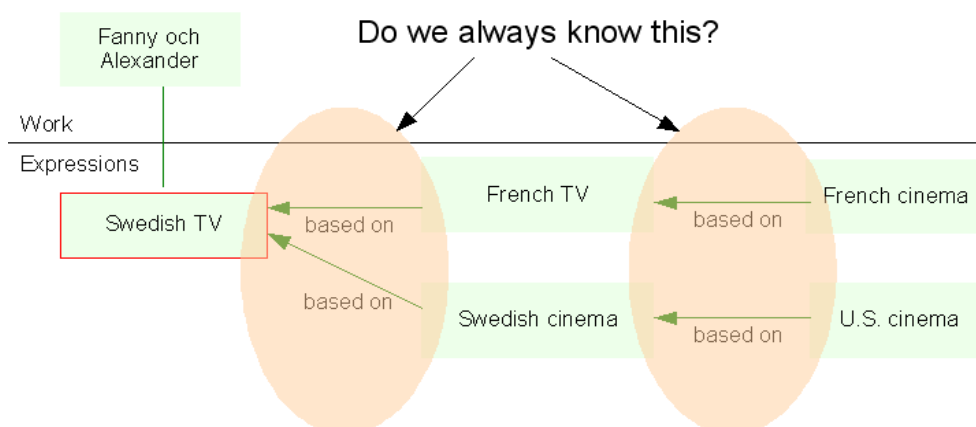


Fig. 2: Selecting an "editio princeps" with incomplete information can lead to unfounded conjectures.

As noted above, we see that FRBR<sub>ER</sub> proposes different sets of relationships for connecting agents to works and expressions. If we discard the FRBR<sub>ER</sub> agent relationships and return to the FRBR<sub>OO</sub> notion of a creation event, then we have *F28 Expression Creation* as the node that connects persons and corporate bodies to both the *Work* and to any number of *Expressions* that may exist.

### Where does the Agent come in?

If we assume that a cinematographic work comes into existence by way of an audiovisual expression, then all agents involved in the process of creation should be associated with what FRBR<sub>OO</sub> defines as *F31 Expression Creation*. Since each expression is created from its own *Expression Creation* event, it could be concluded that each of these should be associated with each of the agents involved in the original creation. As has been noted in the AFNOR comment cited above, for works with multiple expressions this would lead to a combinatorial explosion of associations with name authorities. Moreover, from a knowledge representation perspective, it is not true that actor Gunn Wällgren was present in all events that created the various expressions of *Fanny och Alexander*. It is more likely that she only took part in a single sequence of events that created the raw footage from which expressions were subsequently created by editing, post-production,

dubbing, subtitling, etc. Associating all agents with each expression would also permit redundant statements that can conflict with each other, e.g. an expression of Fanny och Alexander directed by someone else than Ingmar Bergman would clearly qualify as belonging to a different work. Therefore, agent relationships at the expression level should be limited strictly to those that actually differ between expressions, e.g. the speaker creating the dubbing voice for Bishop Vergerus in the German version will be different from the one who is heard in the French version.

From a user's perspective, a cinematographic work is characterised by those features that are shared by all versions, editions, or other variants of the work. Although this requirement is still in line with the FRBR (ER and OO) definitions of *Work*, it is questionable if all properties and relationships specific to cinematographic works, including many types of creation events, are still covered by the definition. Therefore, the data model for the CEN standard should adopt a definition for cinematographic work that encompasses the entire sequence of events that can happen in the creation of a "proto-expression", i.e. a realisation with all characteristics that remain the same across different expressions.

## **Titles**

Since expressions and manifestations of a work can have different titles, the title should *not* be defined as a property of the work. If a uniform title for instances of *Work* is required (e.g. in user interfaces), this can be derived automatically from the title of an appropriate *Expression* or *Manifestation* instance (typically the earliest known expression), taking into account possible titles from compound works with which this expression is associated. Likewise, any simplified (or more complex) representation such as the resource-centric views proposed for digital library interfaces<sup>5</sup>, can also be constructed algorithmically.

Note that this method of deriving work titles dynamically from subordinate entities is also known as "upward inheritance". The same principle can also be used for other data elements if required for a given user task.

## **Relationships with non-film works**

Re-defining the *Work* entity as *Cinematographic Work* may actually facilitate the integration of filmographic data with FRBR-oriented library catalogues. A similar approach has been taken for some FRBR application profiles<sup>6</sup> in order to distinguish a particular definition of *Work* from the more general definition in FRBR<sub>ER</sub>.

If a cinematographic work is based on a work that is also expressed in a non-film medium, then the former can take on the role of a cinematographic expression, or, in terms of FRBR<sub>OO</sub>, an F28 Expression Creation event. It is noteworthy that the FRBR<sub>OO</sub> definition of *F28 Expression Creation* does not specify any cardinality restriction for the *R17 created* property. Thus, a single creation event could bring into existence any number of instances of *F2 Expression*. Although a simultaneous creation of multiple expressions of a film work is not often found in practice, this FRBR<sub>OO</sub> class could still serve as a useful abstraction of the connection between non-film works and their cinematographic expressions.

---

5 As an example, see the concept of *information object* in L. Candela et al.: *The DELOS Digital Library Reference Model, Version 0.98*. December 2007.

[http://www.delos.info/files/pdf/ReferenceModel/DELOS\\_DLReferenceModel\\_0.98.pdf](http://www.delos.info/files/pdf/ReferenceModel/DELOS_DLReferenceModel_0.98.pdf)

6 See, for example, the *ScholarlyWork* entity in the e-prints application profile,

<http://www.ukoln.ac.uk/repositories/digirep/index/Model>

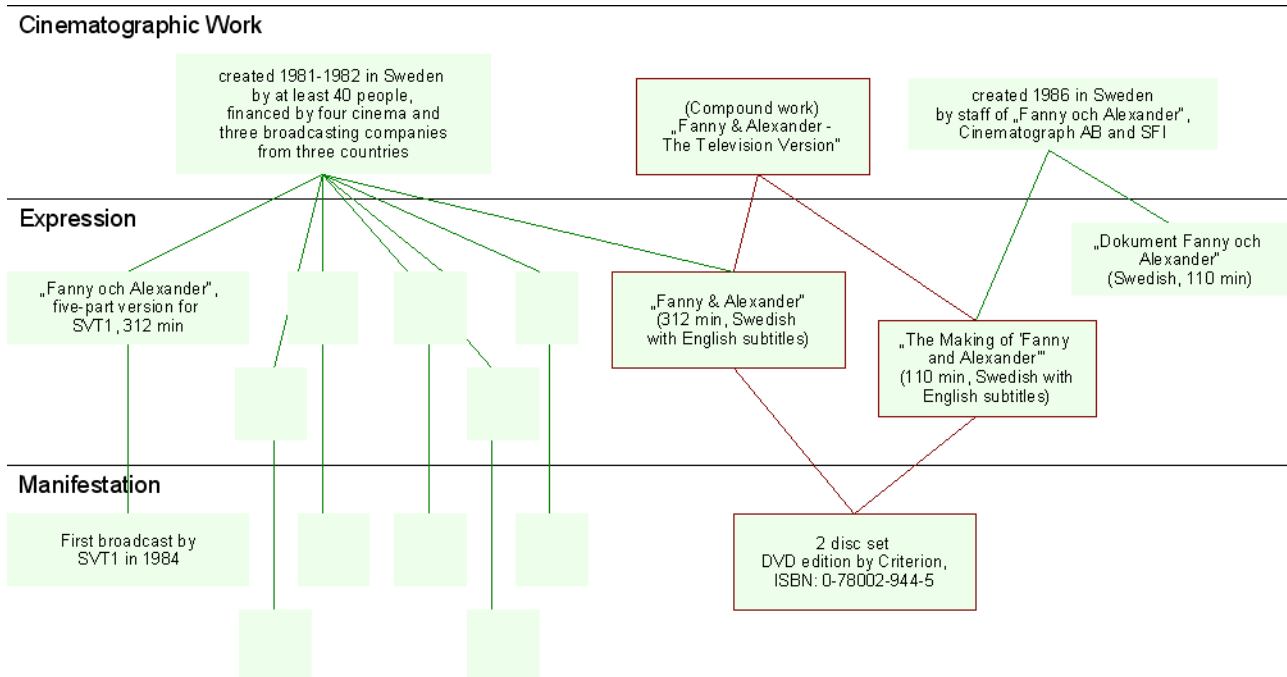


Fig. 3: DVD edition of "Fanny & Alexander - The Television Version" in the context of the model from Fig. 1

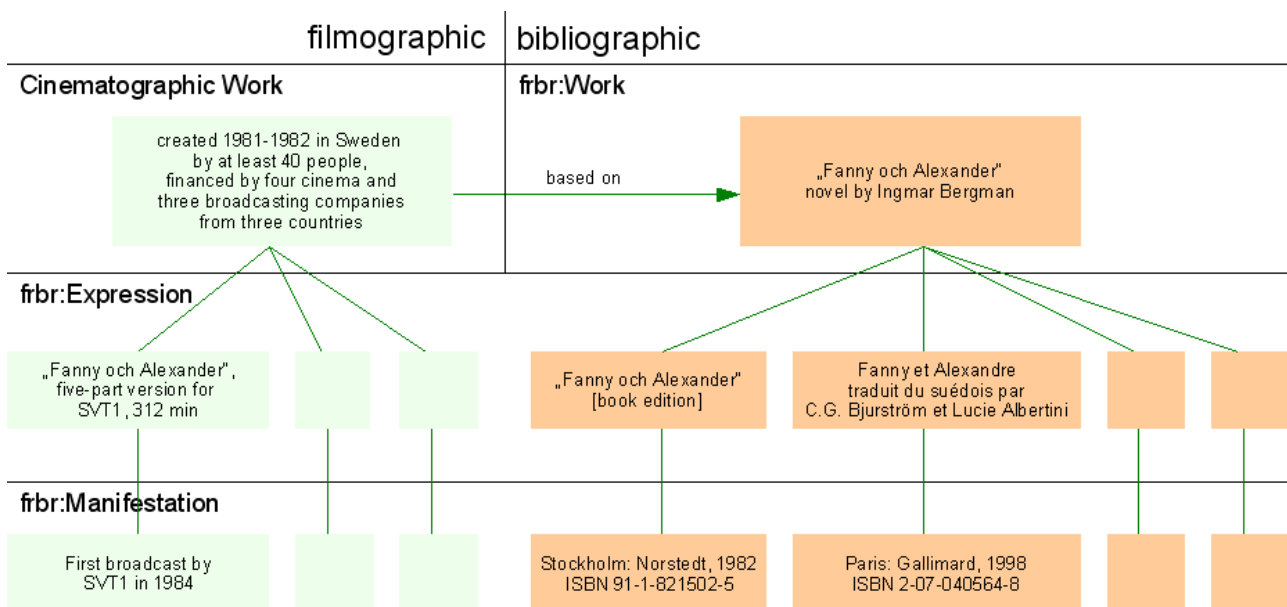


Fig. 4: The Cinematographic Work in its dual role with respect to filmographic and bibliographic settings

In the example from Fig. 4 this relationship is informally labelled with "based on". In FRBR<sub>00</sub>, the approximate equivalent would be property *R19 created a realisation of*, provided that we equate the cinematographic work with *F28 Expression Creation*.

### Should group 1 entities form a class hierarchy?

A major motivation for using FRBR as a data model is that the specified relationships can be exploited for more informative displays and navigation options at the user interface. Most modern user interfaces for library catalogues support aggregate views of multi-part and serial publications,

since these relationships can be expressed in existing bibliographic data structures.

The group 1 entities of FRBR<sub>ER</sub> are defined in a way that suggests a class hierarchy with inheritance relationships between classes. In fact, this is the most common interpretation of the model<sup>7</sup>, even though this interpretation has been criticised as being incompatible with the definitions given in the FRBR<sup>8</sup>. Not accepting some kind of inheritance would require repeated expression of attribute values at each level of the group 1 entities. As Taniguchi observes,

"Defining entities in the hierarchical way presupposes in principle the inheritance of attributes from an entity to its subordinates. Defining entities in the parallel way, on the other hand, does not provide any view on the inheritance of attributes between entities; it is necessary to define attributes at each entity repeatedly where the sharing of attributes among entities is required."<sup>9</sup>

In defining an application model with reference to FRBR, we therefore have to decide if each group 1 entity should be defined as a self-contained description of a resource at the given level, or if each of these entities should contain just the information that is specific to the level of description.

Library cataloguing rules such as AACR and ISBD have introduced the concept of *uniform title* in order to relate multiple manifestations to a single work. Creation of a uniform title record is typically limited to cases where multiple manifestations actually occur within a catalogue, and where these manifestations carry different titles. Thus there is no mandatory *Work* entity in the sense of the FRBR. In the CEN standard, where identification of cinematographic works is the primary focus, leaving the *Work* level optional would miss the goal of the entire standard. We therefore have to adopt an interpretation of the FRBR where an entity that resembles the *Work* is always available, even if none of its attributes can be filled directly.

It should also be kept in mind that a second important purpose for the CEN standard is to support the integration of information from different sources, which usually means local or national catalogues. Compiling filmographic data from more than one source will require some amount of normalisation (in the sense of database terminology) in order to be more useful than a simple concatenation of native catalogue records (which would not require a standard). Here, normalisation is understood as a process where redundant information is eliminated by transforming pieces of information with identical meaning into a single, common representation.

As noted earlier, FRBR<sub>ER</sub> makes no specific assumptions about normalisation or inheritance. It does, however, define the group 1 entities in such a way that they form distinct levels of description, where each level above the *Item* is assumed to contain information that is valid for all instances of subordinate levels. Applying this principle to the analysis of existing (non-FRBR) filmographic records, we gain an important prerequisite for joining information from disparate sources.

---

7 Taniguchi, S.: A Conceptual Model Giving Primacy to Text-level Bibliographic Entity in Cataloging: A Detailed Discussion. Institute of Library and Information Science, University of Tsukuba, 2003.  
<http://www.slis.tsukuba.ac.jp/~taniguch/report200301.pdf>

8 Renear, A.H. and Y. Choi: Modeling Our Understanding, Understanding Our Models - The Case of Inheritance in FRBR. [http://eprints.rclis.org/archive/00008158/01/Renear\\_Modeling.pdf](http://eprints.rclis.org/archive/00008158/01/Renear_Modeling.pdf)

9 Taniguchi, pp.8-9

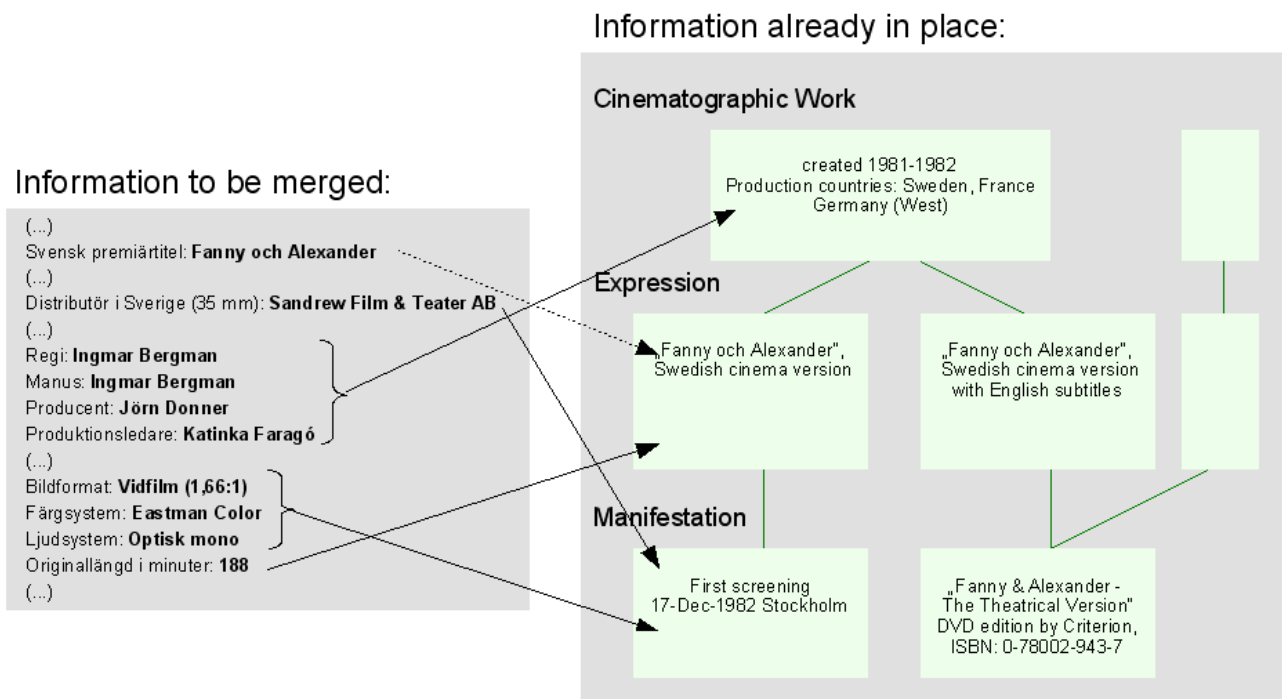


Fig. 5: Using FRBR group 1 entities to merge newly acquired information<sup>10</sup>

Using FRBR group 1 entities in mapping schemes for information from existing sources can help to avoid conflicting information in the target database. In the example from Fig. 5, we have mapped the distribution company to the *Manifestation* entity. Since the Swedish cinema version and the subtitled version used for the DVD edition are described as different instances of *Manifestation*, we can associate the distributor, Sandrews AB, with the Swedish cinema version without making any statement about the distributor of the DVD edition. We also avoid to make statements about the colour and sound systems used on DVD, since the information to be added applies to the 35mm analog film manifestation only.

Returning to the question of inheritance vs. self-contained group 1 entities, this example provides no justification for repeating e.g. all cast and credit statements with every instance of *Expression* or *Manifestation*, as long as associated instances of the other entities are accessible to an information system. It will be the task of the user interface to aggregate information from different description levels in such a way that the requested information appears in a suitable context. For machine-to-machine communication, the "vertical" relationships between the group 1 entities can be expressed in nested data structures such as XML, or they can be communicated as simple binary relationships using e.g. any RDF syntax.

## Conclusions

This paper looks at the FRBR group 1 entities and their usefulness for the purpose of the CEN cinematographic works standard. Group 2 entities are only touched upon in brief and group 3 entities are not covered.

Since a cinematographic work is inseparable from the creation of at least some kind of "proto-expression", we replace the FRBR *Work* entity with *Cinematographic work*. This allows us to circumvent the difficulty of accommodating audiovisual works within the FRBR definition of

<sup>10</sup> taken from *Svensk Filmdatabas*, <http://193.10.144.135/Movie.aspx?Id=5922>

*Work.*

The group 1 entities of FRBR<sub>ER</sub> are interpreted as levels of description in the sense that for every statement made about a resource, there is an appropriate entity to which the statement should be connected either as an attribute or as a relationship. We also define that information expressed in instances of group 1 entities should not be duplicated along the axis of "vertical" relationships, and that information which is constant for all subordinate entities is always expressed at the superordinate level. This kind of "normalisation" is an important prerequisite for merging data from different sources.

For the purpose of the CEN standard, it appears irrelevant whether or not the relationships between FRBR group 1 entities satisfy the formal requirements for inheritance. Since aggregation of information from different description levels occurs at the user interface, there is no requirement for specifying inheritance formally in the data model.

We also depart from an established principle in library cataloguing, whereby a superordinate entity (e.g. uniform title) is only required if two or more different manifestations of a work are known. A minimum filmographic record according to the CEN standard would include all group 1 entities (even if no information at the *Work* or *Expression* level is available) except for *Item*, which will be applicable only in cases where holdings information is to be communicated.

None of these interpretations of the FRBR is entirely new.