Historical Context Ontology (HiCO):
A Conceptual Model for Describing Context
Information of Cultural Heritage Objects

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Abstract. Communities addressing the problem of a shareable description of cultural heritage objects agree that a data-centric and context oriented approach should be reached in order to exchange and reuse heterogenous information. Here we present HiCO, an OWL 2 DL ontology aiming to outline relevant issues related to the workflow for stating, and formalizing, authoritative assertions about context information. The conceptual model outlines requirements for defining an authoritative statement and focuses on how a description of context information can be carried out when data are extracted from full-text of documents.

Keywords: FRBR · TEI · Linked Open Data · Scholarly editions · Authoritativeness

1   Introduction

The cultural heritage domain is a huge and challenging area of interest, also concerning approaches to formal and conceptual description. Commonly, documents, books and artifacts – i.e. objects cured by libraries, archives, museum and more recently galleries, in an open access dimension[1] – are the main focus of representation, dissemination and preservation activities.

   Important topics are now emerging in approaches to conceptualization. First of all, the cultural heritage domain description is mostly related to well-known efforts in representation of meta-level information, while, when dealing with textual documents, description at full-text level represents a semantic issue, on which archives and libraries are now developing new interpretative models (e.g. with regard to scholarly editions). It surely is a shared idea that there is a common need to adhere to interoperability standards, preserving however the richness of data representation. The dominant technique in full-text documents digital representation, is currently document-centric

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[1]   GLAM, Galleries, Libraries, Archives, Museums. Open Knowledge Foundations, OpenGLAM, http://openglam.org/

[1], i.e. oriented to the embedded markup method. Here, a flexibility in descriptive facets prevents the loss of precious information. A real example can be found in Text Encoding Initiative (TEI) activities[2], where the scholarly community has defined a huge schema for encoding a large amount of humanistic/literary features. However, this approach entails to abstain from the creation of a real common vocabulary across communities. It is a well-known issue that each cultural institution (archive, library, museum, gallery) requires specific metadata sets and vocabularies, capable to reach different descriptive needs[3]. The most widely-used metadata sets – primarily, Dublin Core (DC) – demonstrate that while adoption of a shared vocabulary is encouraged, it's always necessary to enrich it in a domain-oriented way, both when dealing with high-level and content-level metadata. Therefore, there is a common interest to converge on a suitable data-centric approach[4] – as the Linked Open Data [2] movement is asking for – which should be capable to represent information regarding:

- content, maybe directly extracted from the full-text of documents;
- context, required to understand content, derived from documents them-selves or from literature;
- provenance and authoritativeness of assertions (i.e. interpretations), both for content and context information.

In fact, another acknowledged topic of interest for cultural institutions is that a cultural object has to be managed in relation to its context. 'Context', meaning any information concerning the network of relations in which a cultural object is somehow involved, is a precious key for interpretation of its content and its identification. Nevertheless, which – and how – information should be formalized is the result of a choice, i.e. a hermeneutical activity made by one or more interpreters, representable as a complex assertion. Then, being information a result of an interpretative process, even such information about the process itself should be provided in order to formalize enriched, self-descriptive and understandable data.

Here we present and analyze a model aiming to correctly deal with above described issues, i.e. extraction of information about content and context of documents (mainly available as TEI/XML files) as RDF statements. In order to reuse data in a Linked Data context, an OWL 2 DL ontology has been defined, called HiCO ontology[5].

In order to describe the model the paper is organized as follows. A special attention is firstly given to the concept of cultural heritage object, involved in the interpretative process. A new object, describing the object of interest, is always created with the purpose of clearly distinguishing three phenomena as RDF assertions: original objects, objects born to explain assumptions, and interpretations (section 3). Then we explain how any information extracted by an agent from the 'content' of an object (i.e. the full-text encoded in a document-oriented perspective), or even from any other source

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[2] Text Encoding Initiative: TEI P5: Guidelines for Electronic Text Encoding and Interchange, http://www.tei-c.org/release/doc/tei-p5-doc/en/html/

[3] Library Linked Data Incubator Group: Datasets, Value Vocabularies, and Metadata Element Sets. W3C Incubator Group Report, 25 October 2011, http://www.w3.org/2005/Incubator/lld/XGR-lld-vocabdataset-20111025/

[4] W3C Data Activity, Building the Web of Data, http://www.w3.org/2013/data/

[5] Daquino, M., Peroni, S., Tomasi, F., HiCO, Historical Context Ontology Documentation (2014), http://purl.org/emmedi/hico

regarding the object (i.e. any other document able to let the interpreter to assert something), can be considered as an entity bounded to the object through an interpretative act. Intuitive or arbitrary categories can be used to define which sphere the interpretation belongs to, and the criterion used to state it. The act of producing RDF statements about real interpretations is an interpretative process too, and should also be identified through a provenance attribution (section 4). After definition of meta-level required to state that information is extracted as an interpretation, content-level has to be modeled. Actually, in order to restrict the scope of the proposal, the model focuses on events, people and people's relation as subjects of interpretation, although it can be simply extended in order to describe any other relevant phenomenon (section 4.3). A particular focus is then devoted to information resulting from event-driven and interpretation-driven approaches, like the formalization of synchronous and diachronic relations among interpretations (section 5). Finally we propose criteria to state authoritativeness of assumptions (section 6).

The project aims then to define, thought the ontology, a methodology – i.e. a workflow – for describing context information of cultural objects as entities indirectly bounded to the objects themselves via an intermediate one (i.e. the interpretation act). This condition ensures authoritativeness of interpretations can be inferred, both in terms of quality (e.g. an interpretation gains authoritativeness through authoritative citations) and in terms of trust (i.e. with a clearly defined provenance of statements). Since Linked Data enable anyone to state assertions about everything (any URI) without owning it [2], an intermediate entity, with provenance statements, ensures a complete, self-descriptive representation. This modus operandi can be useful to communities which daily work with interpretations of literary works – like the TEI community – and need a means to extract information from the full-text of the sources, and then declare paternity of such assertions, without possible complexities generated by contradictory statements.

As use case, for the model and the data testing, an XML/TEI edition has been used, precisely the digital edition of *Vespasiano da Bisticci's Letters* [3], as the better suited example at the current state of the ontology. The edition is the representation (philological transcription with historical notes on people, events, place and dates) of a collection of manuscript letters (archival documents and miscellaneous codices) sent and received by Vespasiano, a Florentine copyist who lived during the XV century.

2   Related Works

To achieve the proposals here presented, and as a good practice, existing ontologies have been reused in HiCO, to solve specific issues: an OWL DL 2 formalization of the FRBR model[6] was considered for a clear definition of layers of cultural objects, and then to outline levels needed to correctly characterize interpretations; certain properties of PROV-O ontology[7] were used to declare provenance of interpretations and to describe some features of the interpretative process; CiTO[8] and PRO[9] ontologies (part

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[6] Ciccarese, P., Peroni, S., Essential FRBR in OWL2 DL, http://www.essepuntato.it/lode/ http://purl.org/spar/frbr

[7] Lebo, T., Sahoo, S., McGuinnes, D.: PROV-O: the PROV Ontology. W3C Recommendation (2013), http://www.w3.org/TR/prov-o/

[8] CiTO, Citation Typing Ontology. Documentation, http://purl.org/spar/cito

of SPAR ontologies[10]) were imported to describe thoroughly relations among interpretations and involved agents; N-ary Participation pattern[11] and again PRO ontology were used to describe information extracted from texts in form of RDF triple.

This work also moves from studies on similar themes in research fields like prosopography, archival science and history: FACTOID ontology [4], which deals with prosopographic information, was the starting point for rethinking and enhancing the definition of an interpretation act; PRoles ontology [5] and EAC-CPF ontology [6] were considered as general models for issues in describing people, their relations and the importance of provenance assertions when extracting information from full-text of resources.

HiCO has been developed using SAMOD methodology[12], which consists of several small steps of an iterative workflow that focuses on creating well-developed and documented models.

Actually, the ontology can be considered ready for a first evaluation, while further analysis and implementations have to be done, e.g. a mapping to CIDOC-CRM[13] and FRBRoo model[14] to test interoperability and consistency of predicates in a wide conceptual model (see section 7 for further explanations). At the same time a possible interaction with EDM[15] will be useful in order to test the HiCO model on cultural heritage collections, i.e. in Europeana.

3   Identifying Cultural Heritage Objects and Interpretations

As we said, cultural heritage object is a wide concept: it includes any sort of representation of culture heritage embodied in a tangible form, like artifacts (books, documents, and works of art), but also any concept, assertion and interpretation somehow bounded to cultural objects. Furthermore, in a broader perspective, any object making explicitly or implicitly assertions about a cultural object – like a scholarly edition or an interpretative essay – could be considered as a cultural object itself, strictly related to the first one.

We can consider a real example on which, as we said before, we test the HiCO ontology: the digital edition of *Vespasiano da Bisticci's Letters*. This edition, embodied in an XML/TEI document, has to be considered as a second cultural heritage object, dealing with the original one, i.e. Vespasiano's original letters. In the edition, an editor states his/her ideas and assumptions, maintaining a direct relation with the subject of interest.

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9   PRO, Publishing Role Ontology. Documentation, http://purl.org/spar/pro
10 SPAR, Semantic Publishing and Referencing Ontologies. Documentation, http://sempublishing. sourceforge.net/ (in particular see CiTO and PRO, developed by University of Bologna research group)
11 Gangemi, A., Presutti, V., Nary Participation pattern. OWL ontology, http://www.loa.istc.cnr.it/ ontologies/naryparticipation.owl
12 Peroni, S.: SAMOD: an agile methodology for the development of ontologies, http://speroni.web. cs.unibo.it/publications/samod.pdf
13 Crofts N., et al. (2011, Nov.). Definition of the CIDOC Conceptual Reference Model (version 5.0.4), http://www.cidoc-crm.org/docs/cidoc_crm_version_5.0.4.pdf
14 FRBRoo Introduction. Documentation, http://www.cidoc-crm.org/frbr_inro.html
15 Europeana Data Model. Documentation, http://pro.europeana.eu/page/edm-documentation

In order to formalize this situation, we have to consider two different *responsible entities* (i.e. the author and the editor of the cultural object), and two different *works*, (i.e. a new cultural object describing the first one); then we should consider the *expression* level of the first one as 'subject' of the new *work*. All these elements can fully be described within FRBR model (fig. 1).
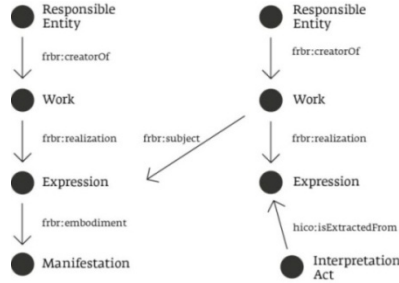

Fig. 1. FRBR representation of cultural heritage objects

Formalizing this scenario in Vespasiano's edition we say that: Vespasiano da Bisticci's first letter ("vdb-work-letter-1") is a work, edited by a person (the responsible entity Francesca Tomasi, "ft", i.e. the editor), by creating another work with an expression into which interpretation acts ("intact") are outlined. In Turtle syntax we could describe the scenario in this way:

```
:vdb-work-letter-1 a frbr:Work .
:vdb a foaf:Person ;
frbr:creatorOf :vdb-work-letter-1 .
:vdb-expr-letter-1 a frbr:Expression ;
frbr:realizationOf :vdb-work-letter-1 .

:ft-work-letter-1 a frbr:Work ;
frbr:subject :vdb-expr-letter-1 .
:ft a foaf:Person ;
frbr:creatorOf :ft-work-letter-1 .
:ft-expr-letter-1 a frbr:Expression; frbr:realizationOf :ft-work-letter-1
.

:intact-1-ft-transc-lett-1
a hico:InterpretationAct ;
hico:isExtractedFrom :ft-expr-lett-1 .
```

More precisely, we consider the original Vespasiano's letters as the object of interest (i.e. a *work*); the text of the work (i.e. one of the possible *expressions* of that work) as the subject of the scholarly edition (i.e. another *work*); in the text of the new work (i.e. in its *expression*), assumptions are made by an editor. Typically, this happens when an interpreter (the editor) is going to create a philological edition (transcription) or an historical essay talking about a source (comment). When it comes to paleographic

studies (graphical signs interpretation), the subject of the new work will be the embodiment of the original letters (i.e. the *manifestation* of the work).

Now consider a statement about the object of interest an editor could assert, like "the letter 19 states that Pipo was the illuminator of the manuscript". It means that underlying data of the text have to be represented in a formal way: to represent information contained in the letter – that may be interpreted in different ways from different editors at different times and not as it is, like an indisputable fact – an intermediate stage is required in order to describe this situation. A correct formalization of the issue prevents contradictory statements about the same subject without a right provenance assertion. An interpretation cannot be just directly related to its subject of interest as a fact, but requires a new entity – physical or not – where the phase of conceptualization (deduction, assumption, transcription etc.) takes place (the new *work*), where the creation of the interpretation happens (the *expression* of the new *work*) and where the authorship of interpretation is clearly defined. Then, its formalization and embodiment (an interpretation act) can be correctly formalized in order to represent something that can change over time or can be questionable.

In fact, by representing such complex entities as a process, and not just through a single assertion, the model enables further possible relations among interpretations (diachronic versioning of an interpretation and synchronous citations between interpretations), between editors (disputes about a theme or else) and between interpretations and cultural objects (criteria for defining authoritativeness of interpretations).

4   Describing an Interpretation Act

As we said, stating something about an object (or extract something from its content) is a subjective 'reading' of an editor.

Following this idea, interpretations, strictly bounded to the expression of a work with a defined authorship, can be considered as facts: they've been chosen by the editor and – in that expression of that work – no other contradictory assertions can be stated. When interpretations are instead directly related to their subject of interest and no authorship is stated, they are represented as facts too, but without the possibility to make other assertions about them, unless invalidating consistency of the first statement.

So an interpretation act is a situation in which an agent can represent some useful information as RDF triples extracting them from the 'content' of an object. This action entails two moments, or better, two other situations as part of a process:

1.   The conceptualization of the interpretation and its classification, for enabling further relations among different kind of interpretations;

2.   The embodiment of the interpretation as RDF statements, for representing information extracted from the content of the object of interest.

These phases involve different agents and different layers of description, but as a complete process, they can be represented as a single entity, the `hico:InterpretationAct` class.

4.1   Conceptualizing an Interpretation

An interpretation act is related to the expression (an `frbr:Expression individual`) where it comes from through a specific object property, `hico:isExtractedFrom`, a subproperty of PROV-O `prov:wasInfluencedBy`, and therefore is indirectly related to the editor of the work in which it is conceptualized.

Individuals of `hico:InterpretationAct` class are also defined through two fundamental object properties: the `hico:hasInterpretationType` property and the `hico:hasInterpretationCriterion` property. The former states an arbitrary classification of the interpretation, which can be simply defined as philological, historical, semiotic, linguistic etc. The latter is a briefly explanation of the criterion used to state information extracted from a source, e.g. a literally transcription, a hypothesis, or the adoption of the literature about a specific argument (fig. 2).

These information are not strictly required, but they are meaningful when trying to explain why an interpretation is more authoritative than another one. Indeed, an interpretation act could be related to other acts through citations: more an act is related to other acts, probably more authoritativeness it gains in literature. Annotating these relations when describing the adopted criterion, could be an easier way to judge (and query) interpretations.
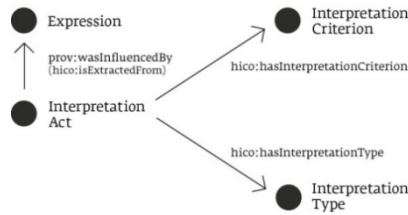

Fig. 2. Conceptualization of an interpretation act

We can continue with the first example. An editor's transcription of the first letter of *Vespasiano da Bisticci's Letters* is a philological interpretation of the text of the letter, obtained through a diplomatic-interpretative approach. In Turtle syntax, we can assert this as:

```
:intact-1-ft-transc-lett-1
a hico:InterpretationAct ;
hico:isExtractedFrom :ft-expr-lett-1 ;
hico:hasInterpretationCriterion
:diplomatic-interpretative-transcription ;
hico:hasInterpretationType :philological .
```

4.2   Representing Information as RDF Statements

Once the abstract phase of an interpretation act has been represented, also its embodiment as an RDF statement has to be formalized. This concept can be expressed through another object property, `prov:wasGeneratedBy`, which relates individu-

als of the class `hico:InterpretationAct` with any entity, representing exhaustively the information extracted by the editor.

Here, a distinction has to be made when talking about the editor of interpretations and the agent responsible for its RDF embodiment. Each individual of `hico:InterpretationAct` has to be related with the agent who materially transforms an assertion into a RDF statement. This one shall be the same editor, but could also be a software agent or another human agent who materially creates the RDF statements. To fix this issue, another PROV-O object property has been reused, `prov:wasAssociatedWith`, which relates the interpretation act with the creator of its RDF statements (fig. 3).
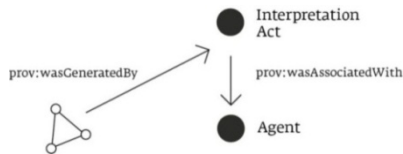
Fig. 3. Embodiment of an interpretation act

To continue with the previous example, we can assert that Marilena Daquino ("md") has extracted the RDF statement about Francesca Tomasi interpretation of the first letter (further explained below, section 4.3):

```
:intact-1-ft-transc-lett-1 a hico:InterpretationAct .
:da-sender-l-1-28-9-1446 prov-o:wasGeneratedBy :ia-1-ft-transc-lett-1 ;
prov-o:wasAssociatedWith :md .
:md a frbr:ResponsibleEntity .
```

4.3   A Focus on Historical Context

Historical context is another wide concept that cannot be uniquely defined. Here it's intended as any information explicitly described in an object of interest (like a description of an event in a document), but also recognized as implicit (like a citation of art styles in a paint), or even any information coming from other objects dealing with the object of interest (parallel or secondary source), which are all useful elements to clearly understand the content of the object and then to identify it as a hub of a network of relations.

All these sort of information are meaningfully part of the context of a cultural object. Trying to define the nature of historical context, different kinds of information can be represented (linguistic, philologic, semiotic, prosopographic, etc.) as information useful to define relevant issues related to the object of interest. In order to simplify possible scenarios, at the current state of HiCO ontology, only information dealing with people, people's relations and participation in events can be represented as extracted statements from the content of an object, in so far as these information represent, in a traditional meaning of historical context, evenemential narratives.

Indeed, a particular focus is given to information about people and events in an event-driven approach, assuming that these relationships can cover a wide range of information about the context, needed by communities to identify, clearly and

unambiguously, their subject of interest, i.e. the cultural object. In spite of this, other types of information can be represented simply importing suitable models for the specific issue, without modifying the TBox of HiCO ontology. Precisely, HiCO imports PRO and N-ary Participation pattern as the simplest and the most comprehensive ontologies that, merged, can represent a wide range of scenarios described in (or dealing with) a document, with a special regard to historical events. In fact, through them it's possible to represent:

- relationships between people;
- relations between people and cultural objects;
- people's time-indexed roles on objects or other people;
- people's participation in events with a time-indexed characterized role;
- objects involved in a space/time-indexed situation.

We can analyze, again, an example from *Vespasiano da Bisticci's Letters*. "Donato Acciaioli ("da") sends the first letter ("item-lett-1") to Vespasiano da Bisticci in 28 september 1446". This is an information extracted from the transcription of the first letter itself which can be represented in Turtle syntax as:

```
:da-sender-1-1-28-9-1446 a pro:RoleInTime ;
tvc:atTime :28-9-1446 ;
pro:isHeldBy :da ;
pro:relatesToDocument :item-lett-1 ;
pro:withRole pro:sender ;
prov-o:wasGeneratedBy :intact-1-ft-transc-lett-1 .
```

5   Diachronic and Synchronous Relations Among Interpretations

Once defined, interpretations can be related each other. As above said, an interpretation with a correct provenance assertion shall be considered as a 'fact' in the expression of the work whence it comes, just because that expression represents the realization of the work at a given time and with specific features at that time. So there cannot be contradictory statements in the same expression.

When it happens, or better when a contradictory statement is needed, an editor has to create a new expression of its work which revises the previous one. As FRBR cataloging rules state about revisability of expressions, it "(...) reflects the expectation that the intellectual or artistic content of the expression will be revised" [7]. This means that conceptual revisions happen at the level of the expression of a work. So, in a new expression, new interpretations may revise a previous one, and such relation can be formally represented directly. For this purpose specific properties of CiTO ontology can be re-used, like `cito:refutes`, for revising statements, i.e. interpretations, rather than revising simply expressions (fig. 4).
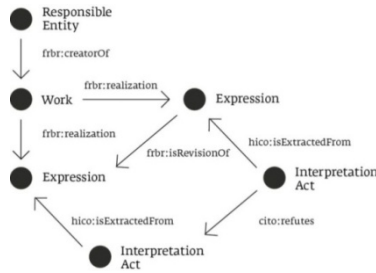
Fig. 4. Diachronic relations among interpretations

Then, through a mechanism of 'versioning', the agent responsible of an interpretation can keep track of the phases of its conceptualization from a diachronic point of view. This approach is useful when different factors can affect the validity of an assertion over time: e.g. an editor may retract his/her interpretation after he/she reads an essay demonstrating that his/her interpretation is wrong.

Although, when an editor follows a theory, he/she should include references to similar studies and other authors' points of view. To achieve this level of description, synchronous citations among interpretations have to be represented too, as well as diachronic ones, through CiTO properties, which offers a detailed range of possible connections between citing and cited entities.

Citations and versioning will establish then a network of relations among interpretations – a literature, with a defined authorship and qualification for each interpretation – that allows further possibilities in querying data and, as below explained, permit to enable inferences about authoritativeness of interpretations.

6   Defining Rules for Authoritative Interpretations

Defining criteria to state authoritativeness of assumptions is an open question, that cannot be solved in an unanimous way. Each community, field of research, school of thought applies different methodologies for defining authorities. Here, we assume as example, without claim of completeness, a common methodology used in philological editions. The aim is to demonstrate how authoritative interpretations can be stated as deduced information, inferred from the network of the aforementioned relations. To reach this goal, a simple SWRL rule[16] is used to formalize requirements that an historical authoritative interpretation must satisfy.

When seeking for historical interpretations, users expect a proof to validate such assertions. Modeling these evidences could be rather arbitrary, but some issues can be formally stated in order to define rules for establishing historical authoritative interpretations.

First of all, an interpretation shall be supported by other editors' similar statements: indeed, agreement with scholarship is considered a shared criterion to state authoritative

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[16] SWRL: A Semantic Web Rule Language. Combining OWL and RuleML. W3C Member Submission (21 May 2004), http://www.w3.org/Submission/2004/SUBM-SWRL-20040521/

assertions. Through the CiTO object property `cito:agreesWith` we can represent such relation between an historical interpretation and any type of other interpretations.

Secondly an interpretation can also be defined with a 'type' declaration, to qualify it in a specific class of assertions (e.g. philological assumptions rather than linguistic ones). So, an historical assumption shall be based on available material evidences, possibly from a different sphere of assumptions, i.e. an historical interpretation shall be supported by a philological interpretation act (the transcription of the text), wherefrom the historical interpretation has been extracted and deduced. Reusing another CiTO object property, `cito:obtainsBackgroundFrom`, to relate interpretations each other, we can meet this condition. We could at the same time specify the nature of the related interpretation through a value qualification of the HiCO object property `hico:hasInterpretationType` (in this case, is `hico:philological`).

At last, an historical interpretation shall be related to an authoritative source for the transcription of the text wherefrom it belongs. Here authoritative means both a source published by an authoritative editor (person or cultural institution), or a source identified by a shareable authority file which defines the object univocally, assuring trust in its description. Likewise other citations, CiTO object property `cito:citesAsAuthority` has been reused.

No one cardinality restriction has been considered, as quantifying citations appears too questionable. In a human-readable syntax the SWRL rule stating these three requirements can be explained as:

```
hico:InterpretationAct(?a)
^ cito:citesAsAuthority(?a, ?b)
^ cito:agreesWith(?a, ?c)
^ cito:obtainsBackgroundFrom(?a, ?d)
^ hasInterpretationType(?d, hico:philological)
  → hico:hasInterpretationCriterion
    (?a, hico:authoritatively-based)
```

These basic requirements improve trust in assertions about historical events, which earn authoritativeness. So, asking for an historical authoritative interpretation in philological editions, an inferred 'criterion' attribution will be bounded to the historical interpretation (the individual `hico:authoritatively-based` as value of the `hico:hasInterpretationCriterion` object property). This approach does not entail that retrieved interpretations are surely true, i.e. facts, but – in a dialectical approach – restrictions on so qualified interpretations, limit the scope, and in terms of query of data, it reduce efforts. E.g. an historical interpretation of Vespasiano da Bisticci's first letter states that Donato Acciaioli wrote some letters in latin instead of Vespasiano (who asked Donato to help him). This assumption was deduced by the editor from his/her transcription of text, based on an authoritative source, and the editor cites other philological interpretations in support to the thesis. An example of first Vespasiano's letter query is, in SPARQL syntax (prefixes declaration is omitted):

```
SELECT ?authoritative-int ?text
WHERE { ?authoritative-int
                   hico:hasInterpretationCriterion
                   hico:authoritatively-based;
                   hico:hasInterpretationType :historical;
                   hico:isExtractedFrom ?expression .
                   ?expression c4o:hasContent ?text }
```

This query returns the URI of the interpretation act inferred as authoritative and its related text, i.e.: "NOTE 1.2 «Donato evidentemente prestava il suo latino a Vespasiano, quando questi doveva contrattare con i committenti delicate questioni relative alle dimensioni e al formato dei codici, alla tipologia dei caratteri da impiegare nella copia, ai costi delle trascrizioni e alle tariffe degli amanuensi. Puntuale e preciso il profilo dell'Acciaiuoli nelle Vite (p. 586 [II, 21]).»[17] "

7   Conclusions and Future Prospects

HiCO provides a complete scenario for describing the interpretative workflow need to represent cultural objects strictly related to their historical context.

Being a first step for defining a methodology, HiCO will have to be tested on other different use cases, in order to verify further implementations of the model. A particular attention will be given to the CIDOC-CRM model, and the FRBRoo extension. A future mapping between HiCO and these models will be provided, in order to guarantee the maximum dialogue and interoperability, under the work in progress Zeri e LODE project [8]. The aim is to create a broad network of assertions about cultural objects and to provide further connections among interpretations, ensuring their qualification and a correct provenance assertion as fundamentals steps for re-use such information in a wide Linked Data environment, allowing more defined and shareable inferences about them.

A future step will be in fact to enable more inferences, in order to establish authoritative interpretations with shareable criteria for other communities and providing thereby different use cases, also taking into account that logical inference cannot faithfully reproduce human's dialectical approach when choosing an assertion rather than another one, but can help in judgment through iterative qualification of interpretations.

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