Knowledge Organization Possibilities for Archives: Comparative Semantic Analysis Between CIDOC-CRM and RiC-CM

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Abstract: We explore the similarities and differences between the two ontologies based on different conceptual models that can be used in archival knowledge organization systems. The first model, RiC-CM, was developed by the International Council on Archives and focuses on producing administrative records. It is complemented by his ontology, RiC-O, and together, they enable the identification and description of records, the agents involved in their creation and use, and the activities that the records facilitate and document. The second model, CIDOC-CRM, also an ontology, was developed by the International Council of Museums and provides guidelines for formally modeling artifacts and cultural heritage. Since archives can contain documents with artistic value, the

CIDOC-CRM model can also be used to represent these records. The research investigates how concepts in the domain of the record can be defined in CIDOC-CRM and RiC-O and identify semantic approximations and divergences between the two ontologies. We analyzed its classes, attributes, relations, and relations attributes, and correspondence was proposed when possible. This ongoing work has been conducted since 2017 and seeks to understand the application of ontological models in records management and archival knowledge organization systems.

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1.0 Introduction

Developing conceptual models that appropriately represent a given universe of knowledge is fundamental to building efficient information systems and involves several disciplines. Knowledge Organization (KO) dialogues with conceptual modeling practices based on their application in the construction of ontologies and the use of ontologies to validate the consistency of a conceptual model. In this sense, conceptual models, which provide ontological artifacts for their application, are fertile ground for investigating the appropriate representation of domain knowledge.

Thus, this research offers an opportunity to explore the similarities and differences between two different ontologies based on two conceptual models regarding the representation of records concepts used in archival knowledge organization systems, representing documents and the context in which they were produced.

The Records in Context-Conceptual Model (RiC-CM) was presented by the International Council on Archives (ICA) as a model for the domain of administrative records production and is complemented by its ontology derived from it, RiC-O (International Council on Archives, 2024). Together, the model and ontology enable the intellectual identification and description of "records, the people that created and use(d) them, and the activities pursued by the people that the records both facilitate and document" (International Council on Archives 2023, 1). The model was released as a complete and official 1.0 version in November 2023. Previous draft versions were released in 2016 and 2021.

The CIDOC Conceptual Reference Model (CIDOC-CRM), developed by the International Council of Museums (ICOM), provides guidelines for formally modeling artifacts and cultural heritage in an ontological artifact. The CIDOC-CRM model can be an option for representing this type of artifact since archives consist of documents with cultural value.

Considering these two conceptual models, our research is guided by the following question: How can concepts of the records domain be represented in CIDOC-CRM, RiC-CM, and RiC-O, and what semantic approximations and divergences can be observed between the two models as conceptual frameworks for records management and archives? It is worth noting that similar investigations have been carried out since 2017 relating ontological models with records management and archival knowledge organization systems (Barros and Gomes 2018; Barros and Sousa 2019).

2.0 Conceptual models and ontologies

The field of conceptual modeling aims to capture and represent a given aspect of reality within the limits of human perception (Wand et al. 1999). Applied ontology offers different principles, according to the ontological view that is being adopted, so that a given domain can be formally represented, capturing the main characteristics of the entities that make up that portion of reality and representing them clearly and unambiguously (Almeida 2020). Given this, it is natural that approximations between conceptual modeling activities and applying its principles to construct ontological artifacts would exist. Historically, ontologies have been inserted into conceptual modeling mainly as an evaluation mechanism for the consistency of conceptual modeling languages (Signore 2009). Verdonck et al. (2019) explain that the two evaluation criteria used to validate the effectiveness of conceptual models, domain adequacy and comprehension adequacy, passed through the sieve of ontologies, where possible errors or ambiguities in the representation could be more easily identified, as well as inconsistencies in the understanding of the domain derived from these flaws.

The second interaction between ontologies and conceptual modeling was based on the understanding that ontologies could offer a theoretical foundation for constructing a conceptual model based on their ability to capture and represent the main elements of the universe they seek to formalize (Verdonck et al., 2019). Although ontological principles (such as whole-part relations and differentiation) are not foreign to conceptual modeling activities, the application of ontology in these activities significantly benefits the developed models. Weber (2003) emphasizes that the ontological commitment made in choosing the ontology to be used for the representation effort serves as a lens that allows the world to be understood under the gaze of that ontological model. While conceptual models alone represent a given segment of reality, the concern of ontology as a discipline is to provide theoretical foundations for understanding reality as a whole. In this sense, foundational ontologies allow for categorizing the elements that are part of reality at a conceptual level, guiding how the very nature of the universe will be understood by the conceptual models that use them as a theoretical foundation (Carvalho et al. 2015). In short, top ontologies provide a way of understanding the whole. These general properties comprise all things that can exist in the Universe intended to be represented in that ontology (Almeida 2013). By committing to this view of the whole, one can develop more conceptually sound models for representing the parts, segmenting Reality into representations such as conceptual models. This perspective is presented below.

Finally, the third interface between conceptual models and ontologies is ontology-driven conceptual modeling or ODCM. Verdonck et al. (2019) state that ODCM differs from traditional conceptual modeling in that ontologies are no longer separate tools that influence conceptual modeling but become modeling techniques themselves, making conceptual models more robust while making their creation even more complex. This adoption of ontologies as conceptual modeling techniques can take place in several ways, such as the extension of an ontological model using conceptual modeling languages or theories (Carvalho et al. 2015) or even the revision of everyday conceptual modeling activities through the integration of ontological principles. The literature points out that there are some divergences regarding the degree of success achieved in the adoption of ODCM techniques instead of traditional modeling techniques, considering the complexity presented by the application of ontological principles and the low effectiveness of the application of these principles in the modeling of low-volume information systems (Verdonck 2018).

Thus, we can observe that the interaction between conceptual modeling and Ontology is manifested in applying ontological theories in traditional modeling activities and in developing ontological artifacts such as conceptual models per se. Among the various ontologies available for representation activities, the CIDOC-CRM model is designed to formally represent cultural heritage and related elements, the ontological perspective of which will be presented below.

3.0 CIDOC-CRM and the event-centered perspective

In continuous development since 1996, the CIDOC-CRM is widely recognized as a high-quality ontological model and serves as a standard for several other modeling and representation projects in the Cultural Heritage and museology domain, covering from archaeological sites to bibliographic documents and even digital documentation and datasets (Biagetti 2021). The CIDOC-CRM aims to provide resources that facilitate the exchange and integration of information on elements of the culture and heritage of humankind, considering the different sources of this information and the different ways in which it is represented by institutions dealing with a larger cultural heritage domain, such as museums and libraries (CIDOC 2024). Given the complexity involved in representing this domain, the entities that make up the model range from top-level classes, expected to basic ontologies that aim to represent reality as a whole, to more specific classes that allow the representation of highly individualized entities.

This breadth of representation possibilities led to CIDOC-CRM being adopted as a standard by ISO, which adapted the concepts presented in the model for the ISO 21127:2014 standard, whose original version dates from 2006. Both the CIDOC-CRM formal definition and the ISO 21127:2014 standard present choices that affect the modeling effort: there are more than one hundred properties that can be applied to represent relationships between entities, and there is no attempt to provide terminology for the domain since the model is not intended to be a thesaurus, offering controlled vocabularies, but rather an ontological perspective through which one can model the domain covered (ISO 2014; CIDOC 2024). New iterations of the CIDOC-CRM and its definition are released at varying intervals, with version 7.1.3 being released as official ISO correspondence in February 2024.

One of the main features of the CIDOC-CRM is its ontological commitment based on an event-centric perspective, which allows for the modeling of processes or evolutions of different individuals, whether they are, in the language of the model, Temporal Entities (class E2 Temporal Entity) or Persistent Items (class E77 Persistent Item). Here, E2 corresponds to the philosophical notion of perdurant entities, while E77 is equivalent to the notion of endurant entities. The event-centric perspective dictates that the entities of E2 can be specific events that also relate to particular individuals through relationships, called properties in the model. These properties are also quite specific, designed to represent Reality through a game of interactions between the temporal entities derived from E2 and the persistent entities derived from E77 so that it is possible to represent the different temporal events that traverse the existence of a persistent individual, as well as the different individuals that have some influence on the events that unfold over time (CIDOC 2024). This reduction of Reality to events involving individuals and occurring within larger historical and geographical contexts is the main strength of CIDOC-CRM in its effort to standardize museum and heritage information from different institutions (Biagetti 2021). Given the role of ontologies in the development of semantically rich web environments, this specification also opens up new possibilities for the operation of intelligent agents that explore models with the semantic markup proposed by CIDOC-CRM, enabling them to make different inferences according to the type of entity or relationship to which their searches are directed, whether they are temporal entities, persistent entities or chains of relationships between individuals of both types (Signore 2009).

The guidelines offered by the CIDOC-CRM serve as the basis for several international projects that deal with the topics covered by the model. An example is the Ariadne, a virtual ecosystem developed by the European Union as an infrastructure for aggregating archaeological datasets. Its interoperability is guaranteed by the AO-Cat ontology, derived from the guidelines proposed by CIDOC-CRM (Niccolucci 2020). The ontology has also contributed to developing various national collections, such as the *German Die Deutsche Digitale Bibliothek* (Biagetti 2021).

Another example of the use of CIDOC-CRM is the Portuguese National Archives, where the model is being used to represent records and funds described by the international archival description standard ISAD(G), or General International Standard Archival Description, developed by the ICA (Koch et al. 2020). The authors presented the development of an extension of the CIDOC-CRM model and auxiliary ontologies to adapt the model to the needs of archival description, especially the need for multi-level descriptions typical of archives and their sets of documents.

4.0 Records in Contexts Conceptual Model and its Ontology

The Expert Group (EGAD) developed the Records in Contexts conceptual model on Archival Description, a group with members from 15 countries formed by the ICA to discuss the integration between existing models of archival description. A first draft version of the model was launched into public discussion in 2016, and a second expanded version was released in 2019, still as a draft, called version 0.2. Meanwhile, an OWL ontology was developed from the conceptual model, and a draft version of the RiC-O ontology was developed in July 2021. RiC-CM v. 1.0 and RiC-O v. 1.0 were released last November 2023.

It also has a document called Foundations of Archival Descriptions that completes the ICA family of documents where the principles and purpose of the archival description are introduced to general users. EGAD is now working on a fourth and final part of RiC, with instructions for the model application, called RiC-AG or Application Guidelines. The model presents some major concepts to describe the context of record production. Its ontology presents important entity classes and properties, along with their relations.

Since its release, the archival community has discussed the ICA model and ontology (Löw et al., 2023; Bianchini, 2022; Mikhaylova and Metilli, 2023; Cé et al., 2023). They were implemented in the National Archives in France, the Netherlands, and the Amsterdam City Archives, among others, and some tools were developed.

Some comparisons were made with other ontologies or conceptual models. Feliciati (2022) analyses the integration of authority control metadata in archives and libraries by comparing the RiC-CM and RiC-O models with the IFLA-LRMs model developed for librarianship. The author concludes that comparing classes and properties is necessary for any interoperability perspective between semantic models. Bianchini (2022) compares IFLA-LRM, RiC-CM, and CIDOC-CRM from the semantic web perspective. Koch et al. (2023) use CIDOC-CRM as a data model for an application called ArchOnto, based in ISAD(G), to describe documents from the Portuguese Archives.

The main characteristic of the model and the ontology is to propose the most important concepts to describe an archival and record production environment and its relations in a relatively simple model. According to ICA, RiC-CM is a high-level conceptual model that describes and identifies record resources and all its components and related entities, like the agent that created or used the record, the agents and activities documented in it, and its contexts. The core concepts are all related to archival records and their production. Record Resource is the main one, a kind of Thing (RiC-E01), defined as information produced or acquired and retained by an agent in the course of life or work activity. It is both an initial production and a reuse of previously existing information. Instantiation is also a kind of Thing, closely related to Record Resource, as the material existence of a record. It is defined as the inscription of information by an agent on a carrier in any persistent, recoverable form to communicate information through time and space. Agent and Activity are the other core model concepts.

5.0 Methodology

The first step in our comparative work was comparing the classes that make up both RiC-O and CIDOC-CRM ontologies, with subsequent steps to analyze other entities. Work on all steps was accomplished by downloading and running both ontologies' files on the Protegé software, widely considered the most usual ontology-building software. For this step in our research, we used the 1.0.1 version of the RiC-O ontology, released in May 2024, and the 7.1.3 version of the CIDOC-CRM, released in February 2024. Figure 1 presents the general taxonomy of both ontologies viewed on Protegé.

At first glance, it is possible to see some similarities between both taxonomies of classes. However, a more detailed observation shows that both models have different priorities. Whereas RiC-O offers more technical and domain-spe-

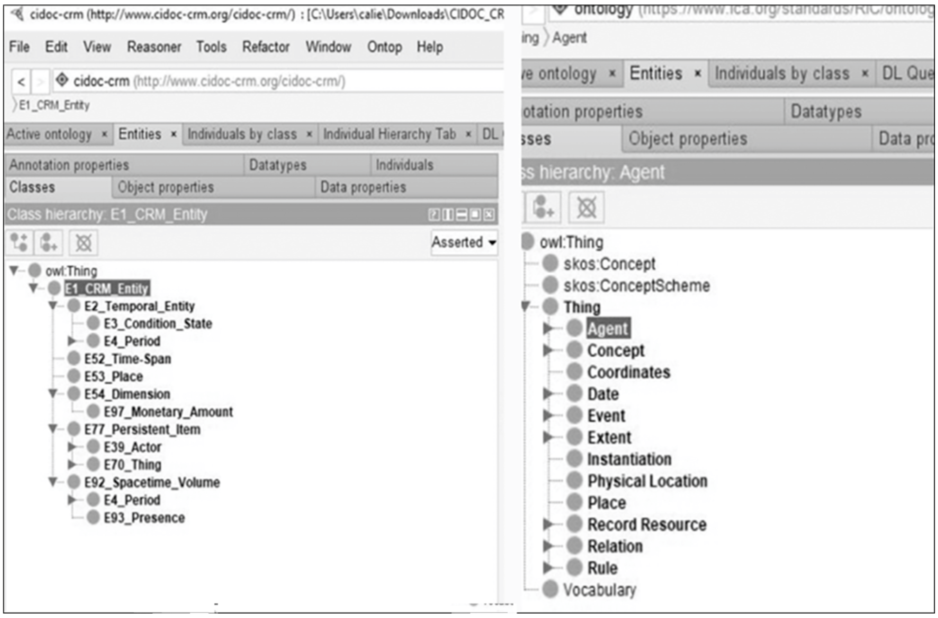

Figure 1. General taxonomy of CIDOC-CRM and RiC-O on Protegé.

cific concepts adequate to represent archival resources, CIDOC-CRM starts its taxonomy with top-level concepts designed to represent the more general scope surrounding Cultural Heritage work and research. It was noticeable, for example, how some of the core RiC-O concepts only appear as second-level subclasses in CIDOC-CRM, subordinated to the more generalist core entities, e.g., RiC-O's Agent versus CIDOC-CRM's Actor.

Comparative work at this study stage used the RiC-O taxonomy as a referential object to find equivalents within CIDOC-CRM. The RiC-O entities used in the comparison belonged to the taxonomy's first and second levels.

During our work, a few RiC-O entities proved challenging to equate with CIDOC-CRM entities. Some, such as Instantiation, could be equated not to a single CIDOC-CRM class but rather to a specific relationship between classes through a specific object property. In other cases, such as Rule, a single CIDOC-CRM class was sufficient to encompass most of the meaning of its RiC-O counterpart, though not all of it, preventing a complete correspondence between the two models.

The following stages of this study were conducted in a slightly different way. Instead of using just the RiC-O and CIDOC-CRM ontologies, our starting point was the RiC-CM list of entities. We then mapped entities from RiC-CM to their equivalents in RiC-O, a process made more straightforward thanks to the RiC-O web page, which handily states what elements listed there are adapted implementations of entities from the conceptual model. After that, we took both listings from RiC-CM and RiC-O and repeated the analytical process of finding equivalents in the CIDOC-CRM.

We quantitatively analyzed the 45 entity attributes described in the RiC-CM, 86 relations, and 06 relation attributes. In many cases, a single entity from RiC-CM was split into two or more counterparts in RiC-O; attributes generally became either datatype properties or classes, while relations expectedly became object properties or classes. In every case, we attempted to find equivalents in the CIDOC-CRM model. Our comparative work aimed at fidelity, always translating RiC-O entities to CIDOC-CRM according to their nature: classes for classes, properties for properties. In some cases, equivalence could be found between one kind of entity but not the other; this was primarily seen in cases where a RiC-CM relation became both a class and an object property in RiC-O. In such cases, the resulting class was meant to represent any generic, open-ended relation, which CIDOC-CRM generally is not meant to model; in those cases, finding an equivalent property in CIDOC-CRM would generally be achieved without issue, but no equivalent class would be chosen. Unlike in the previous stage of this study, where a relationship chain would represent entities without a single CIDOC-CRM equivalent, we decided not to present any elaborate chain, leaving only one-to-one comparisons (there are a few exceptions in which two distinct CIDOC-CRM entities would, in tandem, encompass the whole meaning of their RiC-O counterpart; in such cases, both entities are presented as discrete data in our comparative tables). Finally, as explained in the *Results* section, differences in purpose and scope between the RiC models and CIDOC-CRM caused many entities from the former two not to have an appropriate equivalent on the latter, leading to blank spots in our comparative effort.

All the data are in a public dataset and can be accessed via the DOI 10.5281/zenodo.8367284. In the tables, we present each of the entities used in our comparative work and, in the case of the first table (comparing RiC-CM classes to CIDOC-CRM classes), the reasoning behind the choices made in those cases where no one-to-one equivalence could be found. Our conclusions regarding the experiment are presented below.

6.0 Results

As a preliminary result that permeates all types of entities, our experiment highlighted a few key differences in how Reality is perceived on both CIDOC-CRM and RiC-O. Generally, the entities presented by RiC-O allow for a much more straightforward representation that enables an efficient exchange of relevant information between institutions. Core entities on both the first and second levels of the taxonomy allow for the modeling of information that is relevant to archival work: defining what can be understood as a Record Resource, as well as the elements that, together, constitute the provenance information for that resource, such as the agent behind its production or the mandate that justifies its custody by a given organization. While this might lead to apparently counter-intuitive taxonomical relations (such as Record Resource being on the same hierarchical level as Concept), it is consistent with RiC-O's concern with describing the record resource on itself, as well as the immediate elements that make up the context in which that resource is located.

CIDOC-CRM, on the other hand, offers more general classes at a higher level of abstraction. Understanding Reality as a game of interactions between temporal and persistent entities, CIDOC-CRM allows for modeling an item's history up to and beyond its inclusion in a collection and multiple temporal events as they develop concerning each other. It allowed for richer contextualization of the processes and activities that led to the creation of an artifact or other resource and all parties involved throughout its existence. However, compared to RiC-O, CIDOC-CRM has some noticeable gaps in its representation, mainly when the need arises to model corporate environments. Despite its core classes' high abstraction level, CIDOC-CRM is still conceived for use within Cultural Heritage institutions.

Comparison tables were created using RiC classes, attributes, relations, and relation attributes and their definitions, mapping their CIDOC-CRM equivalents. Correspondences were as accurate and semantically similar as possible but not always identical. When identifying equivalences in classes, we could make some relation chains where there was no direct semantic correspondence. For other tables (attributes and relations), we decided not to make such a relation chain. In this case, the relational chain was not so simple, so we decided to use direct correspondence whenever possible. Concerning relation attributes, there was no related correspondence between RIC and CIDOC-CRM.

Regarding attribute entities from RiC-CM, it was observed that the model treats them as adjacent to its entities, resulting in them being represented as datatype properties in RiC-O. In practice, this means that most of them behave as notes attached to the entities they characterize, having literal- or even string-type data as their possible range. This is due to the less structured nature that such data can have: the datatype property *Rico:history*, for example, is meant to be filled with a free-form text summarizing the development of a given entity; being a data property, it does not point at any other entity in the model as to serve as its range, as CIDOC-CRM would, working instead at such a high-level of granularity and expressing such specific information that it becomes oriented to the human user who works with the model. This open-endedness regarding many datatype properties causes issues when trying to map these attributes to CIDOC-CRM, as that model (at least ideally) would make use of more complex relation chains to express a given item's previous history, making it as close-ended as possible as to facilitate automation and data integration between different institutions. The solution taken to create an equivalence was to make use of the CIDOC-CRM *P3 has note* data property, which allows for the inclusion of free-form, literal-type data (conceptually, this data would be understood as an instance of the class *E62 String*, though that entity is not used in the ontology files of CIDOC-CRM).

In some cases, RiC-O datatype properties were mapped to object properties from CIDOC-CRM whenever the latter offered properties that could fulfill the same semantic function as those from the former model. An example would be the *rico:productionTechnique* datatype property, which was compared to the P32 used general technique (was the technique of) object property. Still, regarding attributes, it was common for RiC-CM models to be translated to the ontology file not only as datatype properties but also as classes in themselves. These classes also worked at a very high level of granularity, representing specific information useful during archival work. In those cases, we searched for CIDOC-CRM classes that would be sufficient to represent their intended meaning. This was primarily achieved without issue, although the open-endedness above of RiC-O attributes, combined with the specificity of the information conveyed, meant that some of these RiC-O attribute-derived classes had to be mapped to more generic CIDOC-CRM classes. The class*Rico: OccupationType*, for example, represents the *"Categorization of a profession, trade, or craft pursued by a Person in fulfillment of an Activity."* Such information would be best represented in CIDOC-CRM as an instance of the *E55 Type* class linked to an instance of the *E7 Activity* through the *P2i*, which is a *type of (has type)* property. As mentioned, we did not express relationship chains when working with RiC-CM entities other than the primary classes. Because of this choice in the procedure*, Rico: OccupationType* was compared to the *E55 Type* class; other similar cases happened during our work. In sum, attributes in RiC-CM are understood less as entities in themselves and more like adjectives to class instances. Even when implemented as classes in RiC-O, their semantic role is conditional to that of another instance, illustrating the characteristics of that instance by being related to it. This helps illustrate how RiC-O is aimed at serving users who deal with archival work, as attributes are implemented to enrich other objects by conveying pertinent information to better characterize them. This creates a contrast with CIDOC-CRM, where the goal of facilitating interoperability between cultural heritage institutions means that there are not many options for representing non-structured knowledge in an accessible form manner, and typification of entities is better implemented through the use of a specific class and the relations that can involve it.

A similar situation involved the relation-type entities from RiC-CM regarding their RiC-O implementation. They were generally translated to the RiC ontology as object properties, although many also had a double implementation, becoming classes. Relations in the RiC models follow the logic mentioned in the first paragraph of this section: they are aimed at modeling, particularly, information pertinent to the provenance of record resources, as well as organizational information relevant to the custody of such items. Another trait mentioned above is the use of somewhat open-ended entities to express information, such as the *rico:WorkRelation* class, which stands for any relation between two Agents who have worked together; another example is RiC-O's very first relation, *rico:isRelatedTo*, which could represent any given interaction between two entities (these entities have sub-relations, but its inclusion is noteworthy). As before, we attempted to map classes to classes and object properties to object properties, although not without difficulties.

In many cases, we could point to an equivalence between a RiC-O property and a CIDOC-CRM property but failed at finding an equivalent class when one was also implemented. At this stage, the emphasis RiC places on representing organizational relations was made very apparent, and CIDOC-CRM's lack of such representation was made more apparent; we could not find a competent equivalent property for the *rico:isOrWasLeaderOf*, which links an agent to an organization they were chief of, in CIDOC-CRM, for example. Certain minutiae also subtly illustrate the differences in end-purpose between the RiC models and CIDOC-CRM: RiC-O has different entities implemented to express different forms of custody of a given record resource, such as *rico:hasCollector* or *rico:hasAccumulator*, allowing greater clarity as to how that record came to be in one's possession, which is very pertinent information to an archivist institution. On the other hand, CIDOC-CRM developed towards cultural heritage institutions, in which the matter of how a given item came to be under that institution's custody is not as relevant, and it does not offer the same level of detail for expressing such information. Similarly, RiC-O offers more properties aimed at representing legal aspects of archival work, such as the Rico: issued property, linking an agent to a given rule they issued or published, a detail that is, at least in this fashion, not so easily represented under CIDOC-CRM.

Finally, the last stage of our study was to map equivalents in CIDOC-CRM to relation attribute-type entities from the RiC models. We could not locate adequate equivalents to these entities in CIDOC-CRM. This can be explained by the purpose each of those three entities, namely, *rico:relationCertainty, rico:relationSource* and *rico:isEvidencedBy*, has in RiC-O. In all three cases, its role in the model is to link a relationship (expressed through the use of properties) to a given entity that will offer validation to that relationship. Thus, the lack of equivalent entities in CIDOC-CRM is due to how matters of validity and attesting of a document's properties are treated in that model. Being specifically aimed at representing cultural artifacts already under custody of a given institution (and related information around those artifacts) means that the end-goal of CIDOC-CRM hardly has concerns of using a given artifact as a documentary, possibly still active resource. This is in direct contrast to the RiC models and their scoped aimed at facilitating activities at archival institutions, where record resources frequently must be used as documents with relevant legal or administrative information. This informational value, which is often of a legal or juridical nature, must be validated through the scrutiny of the record resource. This aspect of archival work explains the need for such entities in RiC-O, and offers a compelling argument as to why relations of equivalence between them and entities from CIDOC-CRM could not be achieved.

7.0 Conclusions

The comparative analysis of the RiC-O and CIDOC-CRM ontologies reveals distinct approaches to representing Reality in the context of archival resources and cultural heritage, given the distinct ontological views each model commits to. The choice for one or another way of observing Reality necessarily happens in accordance with the application and end goal of each model. We can observe that the taxonomical structure has some similarities at first sight; however, important differences emerged after a more in-depth observation at the semantic level. For example, the representation of events is more simplified at RIC and more complex and detailed at CIDOC-CRM. Otherwise, CIDOC-CRM makes an important distinction between intellectual content and material objects. This is due to the nature of cultural heritage material, in which cultural phenomena might be expressed in immaterial form, and its influence can be felt in characteristics such as representations of physical artifacts. In RiC this distinction is not essential as all records are, in some way, a material object. So, the problem of distinguishing between content and carrier is solved by the *Instantiation* class; i.e. The same content can be instantiated in a different carrier through time and space.

RiC-O provides a more straightforward representation focused on enabling efficient information exchange between institutions, with core entities that allow for the modeling of information relevant to archival work. It describes the record resource itself and the immediate elements that make up the context in which it is located. CIDOC-CRM, on the other hand, offers more general classes at a higher level of abstraction, understanding the reality of interactions between temporal and persistent entities. It allows for modeling an item's history, multiple temporal events, and the parties involved. However, CIDOC-CRM has some noticeable gaps in its representation, especially when modeling corporate environments. Despite the high level of abstraction of its core classes, it is still conceived for use within Cultural Heritage institutions. CIDOC-CRM offers an ontological commitment to the division between temporal and physical entities with a level of granularity that RiC-O lacks. The properties of both models allow the relationship between events, which may be relevant to documentary sets.

There is some overlap between both domains, but they are distinct ones, with their specificities. This overlapping between the cultural heritage and archival work domains may explain why there is not a large number of studies and efforts made to compare these two models. In summary, both conceptual models have their strengths and limitations, and the choice between them should be based on the specific needs of the records or cultural heritage project or when dealing with archival records and heritage objects.

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