Ivančica Sabadin[1]

THE PROCESS OF TRANSFORMING ARCHIVAL DATA INTO A MULTIDIMENSIONAL FORMAT

Abstract

Purpose: *The purpose of this research is to develop a process that will facilitate the conversion of archival records created according to the multi-level standard into records created according to the multidimensional conceptual model.*

Method/approach: *The main research method was case study, used to conduct research on the implementation of the proposed process to the archival description.. Other methods were descriptive, comparative and analytical.*

Results: *The process consists of five steps and has been presented on the existing description of technical documentation of former factory Tomos Koper. A knowledge graph containing entities and links was developed to enhance understanding.*

Conclusions/findings: *Upon completion of the case study, it can be concluded that the presented process is adequate and can be used as a basis for the development of a software tool for record conversion. However, to ensure the reliability, it will be necessary to test it on a larger number of records and to evaluate it by technical and archival experts.*

Keywords: *Archival records transformation, Archival standards, Multi-level description, Multidimensional description, ISAD(G)2, Records in Contexts*

1   Ivančica Sabadin, PhD student of Archival Sciences at Alma Mater Europaea University, Slovenia, e-mail: ivancica.sabadin@almamater.si.

IL PROCESSO DI TRASFORMAZIONE DEI DATI DI ARCHIVIO IN UN FORMATO MULTIDIMENSIONALE

Abstract

Scopo: *Lo scopo di questa ricerca è sviluppare un processo che faciliterà la conversione dei record di archivio creati secondo lo standard multilivello in record creati secondo il modello concettuale multidimensionale.*

Metodo/approccio: *Il principale metodo di ricerca è stato lo studio di caso, utilizzato per condurre ricerche sull'implementazione del processo proposto nella descrizione archivistica. Altri metodi erano descrittivi, comparativi e analitici.*

Risultati: *Il processo consiste in cinque fasi ed è stato presentato sulla descrizione esistente della documentazione tecnica dell'ex fabbrica Tomos Koper. È stato sviluppato un knowledge graph contenente entità e collegamenti per migliorare la comprensione.*

Conclusioni/risultati: *Al completamento dello studio di caso, si può concludere che il processo presentato è adeguato e può essere utilizzato come base per lo sviluppo di uno strumento software per la conversione dei record. Tuttavia, per garantirne l'affidabilità, sarà necessario testarlo su un numero maggiore di record e valutarlo da esperti tecnici e archivistici.*

Parole chiave: *Trasformazione dei record d'archivio, Standard di archiviazione, Descrizione multilivello, Descrizione multidimensionale, ISAD(G)2, Records nei Contesti*

PROCES PRETVORBE ARHIVSKIH PODATKOV V VEČDIMENZIONALNO OBLIKO

Izvleček

Namen: *Namen raziskave je razviti proces, ki bo olajšal pretvorbo arhivskega gradiva, ustvarjenega po več nivojskem standardu, v gradivo, ustvarjeno po večdimenzionalnem konceptualnem modelu.*

Metoda/pristop: *Glavna raziskovalna metoda je bila študija primera, s katero smo izvedli raziskavo implementacije predlaganega procesa v arhivski opis. Druge vključene metode so deskriptivna, primerjalna in analitična.*

Rezultati: *Postopek je sestavljen iz petih korakov in je predstavljen na obstoječem opisu tehnične dokumentacije nekdanje tovarne Tomos Koper. Za izboljšanje razumevanja je bil razvit graf, ki vsebuje entitete in povezave.*

Sklepi/ugotovitve: *Po zaključku študije primera je mogoče ugotoviti, da je predstavljeni proces ustrezen in ga je mogoče uporabiti kot osnovo za razvoj programskega orodja za pretvorbo zapisov. Za zagotovitev zanesljivosti pa ga bo treba preizkusiti na večjem številu zapisov ter oceniti s strani tehničnih in arhivskih strokovnjakov.*

Ključne besede: *Transformacija arhivskega gradiva, Arhivski standardi, Več nivojski opis, Večdimenzionalni opis, ISAD(G)2, Zapisi v kontekstu*

1. INTRODUCTION

The Records in Contexts Conceptual Model (RiC-CM) has been developed over the last decade by the International Council on Archives (ICA). The model describes and explains the multidimensionality, which is made possible by Linked Data technology. Since there is not much research on the conceptual model of RiC and we do not have any information on whether and how this model would help us to describe archival docume ntation, a study will be carried out to help us make a final decision, which could also be useful for other Slovenian archives. One of the advantages of Linked Data technology is that it presents data in a machine-readable format, which means that the data is ready to be used to build various software tools and apply artificial intelligence or new technologies.

"The purpose of archival description is to identify and explain the context and content of archival material in order to promote its accessibility" (ISAD(G)2, 2000, 7). Archival records are described in accordance with standards. Four standards are currently in use regarding archival description:

- General International Standard Archival Description, second edition (ISAD(G)2)[2]

- International Standard Archival Authority Record for Corporate Bodies, Persons, and Families (ISAAR (CPF))[3]

- International Standard for Describing Functions (ISDF)[4] in

- International Standard for Describing Institutions with Archival Holdings (ISDIAH)[5]

ISAD(G)2 was developed by the ICA in 2000 and is the standard on which current legislation is based. The ISAD(G)2 standard sets out rules for archival description that can be applied regardless of the form or medium of the archival material and allows for the integration of descriptions from different locations into a single information system (ISAD(G)2, 2000, 7). The ISAD(G)2 standard enables multi-level description, which allows us to create a hierarchical model in which each level of the arrangement has a differing degree of detail (ISAD(G)2, 2000, 8).

---

2   See more: https://www.ica.org/resource/isadg-general-international-standard-archival-description-second-edition/.
3   See more: https://www.ica.org/resource/isaar-cpf-international-standard-archival-authority-record-for-corporate-bodies-persons-and-families-2nd-edition/.
4   See more: https://www.ica.org/resource/isdf-international-standard-for-describing-functions/.
5   See more: https://www.ica.org/resource/isdiah-international-standard-for-describing-institutions-with-archival-holdings/.

The question is whether the ISAD(G) standard is still relevant today, more than 20 years later, especially in light of the changes that have taken place in that time. Pitti et al. (2016, 175) state that since the first publication of the ISAD(G) standard, communication technologies have influenced changes in the processes archivists use to describe and provide access to materials. "Good archival description goes beyond a list of items in a collection and attempts to contextualize them" (Roke and Tillman, 2022, 175). The authors continue by noting that linked data technology allows for the creation of links between descriptions, making it easier to understand the material being described.

In 2012, the ICA established the Expert group on archival description (EGAD)[6], which was tasked with "developing a comprehensive descriptive standard that reconciles, integrates, and builds on the four existing standards" (Pitti et al., 2016, 174). This standard is now known as Records in Contexts (hereafter RiC). "The first goal of ICA, with RiC, is to unify the current standards ISAD(G), ISAAR, ISDF and ISDIAH, adding changes that reflects the new concepts observed in the archives. The centralization of the models tends to make easy the understanding and utilization of the standard by the archivists at the same time that allows the standardization of tools that support the archival description" (Souza & Flores, 2021, 2). "The multidimensional aspect of the RiC becomes its main difference from previous standards, intending to express in a more real and trustworthy way the environment in which the records are inserted. In contrast to the previous models, which are represented in an tree format that reflects the hierarchy of the archives, the RiC is represented through a non-directional graph, with the nodes being the entities with their properties and the edges being the relationships between the entities, also with their properties (Souza & Flores, 2021, 3)".

The conceptual model of RiC is based on entities, attributes, and relations between entities. The main objects of RiC-CM are entities, which are represented in a hierarchical structure. At the root is the *thing* entity, because all other entities are kinds of thing. Four core entities are record *resource*, *instantiation*, *agent* and *activity* (RiC-CM, 2023, 17). Popovici (2020) argues that instantiation is a new term for the archival community. The author states that based on the original definition of instantiation, there is no record without instantiation.

---

6   See more: https://www.ica.org/ica-network/expert-groups/egad/.

2. LITERATURE OR THEORETICAL BACKGROUND OVERVIEW

"When end users try to retrieve records, they run into problems like lack of accuracy and insufficient recall when using the search engines provided, interfaces and lists of results that are difficult to understand, links between items that are not visible nor processable when they exist, or even several interfaces provided for the same archival institution" (Clavaud & Wildi, 2021, 4).

"To faithfully describe archival records, archival descriptions should include the content, context, and structure of records as the fundamental components for describing a fonds/collection" (Zou, 2019, 2). "Due to insufficient/confusing contextual information in the current archival descriptions, when users browse and search for information from archival descriptions on the Web, it is difficult for them to find proper archival descriptions and understand what is described in the archival context" (Zou, 2019, 3). The author further states that archival records are most often stored in a relational database and presented online using HTML[7], PDF[8] or XML[9] technologies. Software tools such as AtoM[10] and ArchivesSpace[11] also allow data to be exported in the EAD XML[12] format (Zou, 2019, 4). The situation is similar in the Slovenian archives, as the scopeArchive[13] tool used also allows data to be exported in EAD XML format and thus published on the European Archives Portal Cunha (2020, i) conducted a study on the user experience of linked data systems in historical archives. The results showed that users are interested in new systems that allow them to create and link data to historical records. Graphical data visualisations are more suitable for searching data than for creating new records.

There are a growing number of examples in the literature of the implementation of the RiC standard in archives. "RiC-O Converter[14] is an open-source command-line tool to convert EAD finding aids and EAC-CPF[15] authority records to RDF[16] files conforming to ICA Records in Contexts ontology (RiC-O)" (Francart et al., 2021, 1).

---

7   HTML – Hypertext Markup Language. See more: https://html.spec.whatwg.org/ multipage/.
8   PDF –Portable Document Format. See more: https://www.adobe.com/acrobat/about-adobe-pdf.html.
9   XML –Extensible Markup Language. See more: https://www.w3.org/XML/.
10   See more: https://www.accesstomemory.org/en/.
11   See more: https://archivesspace.org/.
12   EAD XML –Encoded Archival Description XML. See more: https://www.loc.gov/ead/.
13   See more: https://www.scope.ch/en/product-overview/scopearchiv/.
14   See more: https://github.com/ArchivesNationalesFR/rico-converter.
15   Encoded Archival Context for Corporate Bodies, Persons, and Families. See more: https://eac.staatsbibliothek-berlin.de/.
16   Resource Description Framework. See more: https://www.w3.org/RDF/.

Souza and Flores (2021, 2) conducted a qualitative study on the use of the RiC model in the Federal University of Santa Maria, with the aim of analysing the changes brought by the new standard. Mikhaylova & Merilli (2023) conducted a study on the use of the RiC-O ontology in architectural archives. Based on the RiC-O ontology, the authors developed a new ontology for representing architectural records.

3. METHODOLOGY

The main objective of the research is to develop a process for transforming existing archival descriptions, produced according to the ISAD(G)2 standard, into archival descriptions based on the RiC conceptual model.

Several scientific methods were used. Descriptive method was used to describe basic concepts of ISAD(G)2 standard and RiC – Conceptual model. Elements of description defined by ISAD(G)2 were compared to attributes, entities and relations of RiC using the comparative method. Analytical method was used to prepare, represent and better understand data used in archival records. The main research method was case study. "Case studies are a strategy of inquiry in which the researcher explores in depth a program, event, activity, process, or one or more individuals" Creswell (2009, 30). The case study method was used to conduct research on the current Tomos technical documentation material. The results are presented in tabular form to show the entities, attributes and relations. A knowledge graph was created to better show the relations between the entities.

For the purposes of the paper, the research will be limited to holdings at the following levels: fonds, series and sub-series. The research will be carried out on the already described material of the Regional Archives Koper using the scopeArchive tool. Detailed research will be carried out as part of the PhD thesis.

4. RESULTS

The transformation will be done on the grounds of two forms available in the scopeArchive tool, the form for fonds ("SIRA_REGISTER_FONDOV") and the general form ("SIRA_DESCRIPTION_GENERAL"), which is used for units of description at the levels of series, sub-series, files and items.

4.1 TRANSFORMATION PROCESS

The data transformation process consists of the following phases:

1. *Data export from the scopeArchive tool*. The data can be exported in EAD XML format using the scopeArchive tool.

2. *Identification and interpretation of the relevant fields.* The transformation process is limited to units of description with the status "Completed" in the scopeArchive tool. This means that the archival description has been checked by a competent archivist, has been published in the Virtual Archive Reading Room[17] and contains at least the five essential elements of description (signature, title, extent, date of creation and level of description (UVDAG, 2017). If some units of description do not contain the basic elements, the description must be further processed by a competent archivist. In addition to the essential elements of description, conditions of accessibility and relations to other units of description are important.

3. *Ontology Mapping*. For the purposes of this paper, the "EAD to RiC" mapping proposed by Francart et al. (2021) and used to develop the RiC-O Converter tool will be used as a starting point. As the mapping was created for RiC-O 0.2[18] it will be analysed and adopted for RiC-O 1.0.2[19]. In this step, data will be analysed and compared to better understand the conversion from EAD to RiC-O. Rules for the data conversion will be developed in this step. This phase consists of the following steps:

   3.1. Rules for the identification of entities.

   3.2. Data mapping based on Francart et al. (2021). Identification of data transformation rules.

   3.3. Identification and mapping of entities not included in step 3.2. As some of the elements of description are characteristic of SJAS[20], and are not included in EAD, these elements should be identified and mapped separately.

4. Creation of relations between the entities. Relations should be created according to the RiC Conceptual Model and arranged in separated .rdf files according to the relation types listed in RiC-CM (2023, 75–76).

5. *Population[21] of RiC-O ontology*. Based on rules created in previous step, the RiC-O ontology is populated with instances and relations are created. The results are displayed in the form of a knowledge graph.

---

17   See more: https://vac.sjas.gov.si/vac.
18   See more: https://github.com/ArchivesNationalesFR/rico-converter/tree/master/docs.
19   See more: https://github.com/ICA-EGAD/RiC-O/tree/master/ontology/current-version.
20   SJAS – Slovenska javna arhivska služba (eng. *Slovenian public archival service*).
21   »Ontology Population (OP) looks for identifying instances of non-taxonomic relationships and properties of an ontology with knowledge discovered from different data sources such as text documents« (Faria et al. 2014, 27).

4.2 THE CASE STUDY OF TOMOS MANUFACTURING COMPANY

The official tool for describing archival material in Slovenia is scopeArchive, which is based on the ISAD(G)2 standard. According to the ISAD(G)2 standard, it is possible to describe material according to a multilevel principle. In relation to the objective, a case study was carried out for units of description at the fond, series and sub-series level for the archival description of Tomos technical documentation. For the case study, series and sub-series were created in the test environment of the scopeArchive tool.

1. **Data export from the scopeArchive tool**

   In the first step archival description was exported using plug-in in scopeArchive tool. An archival description was exported to EAD XML format.

2. **Identification and interpretation of the relevant fields**

   The units of description are checked, and it is established that all forms contain the basic elements of description. Conditions of accessibility were also present. Detected elements of description are showed in table 1.

Table 1: Identified elements of description

Elements of Description	Level of description	Original ISAD (g)2 elements
Name of creator (s) Administrative history Physical characteristics and technical requirements	Fond	YES
Provenance Archivist in charge Archival material acquisition	Fond	NO
Level of Description Reference Code Title Date (s) Extent Scope and content System of arrangement Language of material Finding aids Existence and location of originals Note(s) Creator(s) Rules or Conventions	Fond, Series, Sub-series	YES

Types of archival material Other holder Classification Record Status Record precision Record language Record script	Fond, Series, Sub-series	NO
Descriptor (s)	Series, Sub-series	NO

As the description was made at series and sub-series level, there were no relations to other documents. Relations will be more important for units at file and item level.

3. ONTOLOGY MAPPING

After analysing and comparing the data, the following rules were established:

3.1. Following entities should be created:

a. RiC-E03 Record Set for each individual unit of description at fond, series and sub-series level

b. RiC-E18 Date for each unique year and/or date.

c. RiC-E15 Activity for each unique activity, e.g., acquisition, appraisal.

d. RiC-E22 Place for each unique location, storage, shelf, etc.

e. RiC-E08 Person for each unique person who has participated or is participating in the process of creating and preserving the materials and records.

f. RiC-E06 Instantiation for each instance of record resource.

3.2. An example of data mapping is shown in the table 2.

Table 2: Data mapping example

ISAD(G) 2 - scopeArchiv	RIC	RiC-E03 Record set			
Elements of description	Type	Value	Related To	EAD path	RiC-O
Level of description	Attribute	RiC-A36 Record Set Type		/ead/archdesc/@level | /ead/archdesc/dsc//c/@level	rico:RecordSetType
Reference Code	Attribute	RiC-A22 Identifier		/ead/archdesc/did/unitid | /ead/archdesc/dsc//c/did/unitid	rico:identifier on the first rico:Instantiation of the rico:RecordResource.
Title	Attribute	RiC-A28 Name		/ead/archdesc/did/unittitle | /ead/archdesc/dsc/did/unittitle	rdfs:label and rico:title
Date (s)	Relationship	RiC_R069i OR RiC-R068i OR RiC-R071i OR RiC-R073i	RiC-E18	/ead/archdesc/did/unitdate | /ead/archdesc/did/unittitle/unitdate | /ead/archdesc/dsc//c/did/unitdate | /ead/archdesc/dsc//c/did/unittitle/unitdate	rico:hasBeginningDate + rico:date OR rico:hasEndDate + rico:date OR rico:isAssociatedWithDate + rico:date OR rico:hasModificationDate + rico:date
Types of archival material	Attribute	RiC-A10 Content Type		/ead/archdesc/physdesc/genreform | /ead/archdesc/dsc//c/did/physdesc/genreform | /ead//did/physdesc/genreform	rico:ContentType
Extent	Attribute	RiC-A35 Record Resource Extent		/ead/archdesc/physdesc/extent | /ead/archdesc/dsc//c/did/physdesc/extent | /ead//did/physdesc/extent	rico:recordResourceExtent

3.3. Identification and mapping of specific elements of description. As mentioned in the previous step, certain elements of description are specific to Slovenian archives. These elements are shown in the table 3. For this research some elements will not be mapped. It is necessary to conduct interviews with archivists in order to determine the necessity and mapping options for these fields.

Table 3: Elements of description specific to Slovenian archives

Elements of description	Type	Value	Related To	RiC-O
Acquisition	Activity	RiC-R033i	RiC-E15	rico:resultsOrResultedFrom + rico:Event
Processing notes	Atribute	RiC-A43 General Description		rico:generalDescription
Script	Atribute	RiC-A25 Language		rico:Language
Import classification	*not mapped*			
Archivist in charge	Relationship	RiC-R038i	RiC-E08	rico:hasManager + rico:Person
Descriptor (s)	*not mapped*			
Classification	Attribute	RiC-A07 Classification		rico:classification
Creator(s)	Relationship	RiC-R027	RiC-E08	rico:hasCreator+rico:Person
Record Status	Atribute	RiC-A39 State		rico:RecordState
Record precision	*not mapped*			
Record language	*not mapped*			
Record script	*not mapped*			
Rules or Conventions	Relationship	RiC-R063i	RiC-E16	rico:wasRegularedBy+rico:Rule

3.4. Creation of relations. Relations were created according to the example in table 4. For each relation there is an information about source, target, relation identification and type.

Table 4: Example of relations

Source		Relationship	Target		Type
RiC-E03 - Record Set	TOMOS Koper	RiC-R026 - Has provenance	RiC-E11 Corporate Body	TOMOS Koper	provenance
RiC-E03 - Record Set	TOMOS Koper	RiC-R068i - Has beginning date	RiC-E18 Date	1954	date
RiC-E03 - Record Set	TOMOS Koper	RiC-R071i - Has end date	RiC-E18 Date	1998	date
RiC-E03 - Record Set	TOMOS Koper	RiC-R038i - Has manager	RiC-E08 Person	Test Archivist	management
RiC-E03 - Record Set	TOMOS Koper	RiC-R025 - Has instantiation	RiC-E06 Instantiation	SI_PAK/1046 TOMOS Koper	record resource to Instantiation
RiC-E03 - Record Set	TOMOS Koper	RiC-R024 - Includes	RiC-E03 - Record Set	SI_PAK/1046/001 Fototeka	whole-part
RiC-E03 - Record Set	TOMOS Koper	RiC-R024 - Includes	RiC-E03 - Record Set	SI_PAK/1046/002 Tehnična dokumentacija	whole-part

4. POPULATION OF RIC-O ONTOLOGY

The RiC-O ontology was manually populated based on the rules defined in the third step. The results are presented in the example of a knowledge graph (Figure 1). For better visualisation, only part of a knowledge graph is shown.
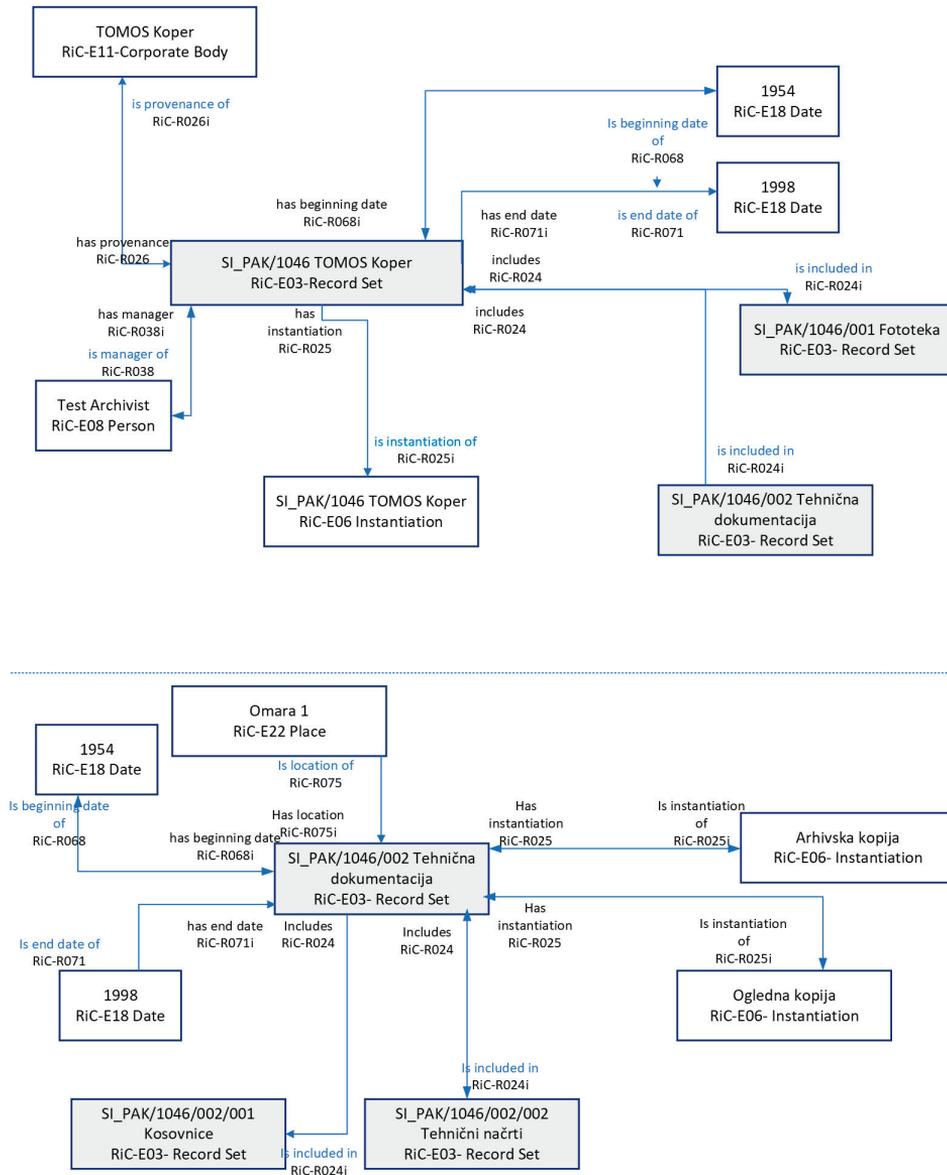
Figure 1: Knowledge graph

5. DISCUSSION

The main objective of the research is to develop a model for transforming existing archival records, created according to the ISAD(G)2 standard, into archival records created according to the RiC conceptual model. The methodology and the software tool for converting existing records to the RiC standard have been developed by the French National Archives. The software tool 'RiC-O Converter' (Francart et al., 2021) allows the conversion of EAC - CPF and EAD records to RiC-O. Francart et al. (2021) presented two processes that generate records corresponding to the RiC-O ontology from an initial EAC-CPF or EAD file. In the case of the input EAC-CPF file, agents, locations and relationships are generated as results. In the last step, a deduplication process is also performed with the aim of deleting duplicate links. In the case of an input EAD file, the result is the corresponding RDF/XML file. The tool also allows flexibility because " the output files can be splitted into smaller files, with the top Record Resource in one file, and each "branch" of the finding aid in a separate file" (Francart et al., 2021, 4).

The outcome of the mapping was also analysed by Souza and Flores (2021), who created an RDF/XML file based on the RiC-O ontology. The authors emphasised the significance of unique identifiers.: "All the entities are assigned to an identifier that is used to do the references in their relationships" (Souza & Flores, 2021, 5).

A case study is carried out on the units of description of the Tomos technical documentation, and a knowledge map is produced as a final result. In the case study, entities, attributes and relations are created and a unique identifier is assigned to each entity. It can be concluded that the model presented is appropriate and can be the basis for the creation of a software tool for the conversion of records. However, the model needs to be tested on a larger number of records and evaluated by technical and archival experts.

The advantage of RiC-CM and other standards based on Linked Data technology is that they can bring together cultural heritage records to provide comprehensive access for users, researchers and archivists. "Regardless of the actual model on which a particular system is based, it is expected to be interoperable and equipped with communication links that promote the seamless use of cultural heritage across institutions and technologies" (Koch et al., 2023, 20).

6. CONCLUSION

This paper presents transformation from ISAD(G)2 standard to Records in Contexts Conceptual Model. The emphasis is on transformation to conceptual model, because of better understanding. Ontology form and syntax is less user-friendly when compared to conceptual model. The transformation was presented from a data perspective and will be part of much more detailed PhD research.

The developed model includes five steps and has been tested on the currently existing description of the technical documentation of Tomos Koper (SI_PAK/1046 TOMOS Koper). Further steps are: extension and adaptation of the model for a representative number of records, which will include, in addition to series and sub-series, the records describing cut sheets and technical plans; development of a software tool for the conversion; testing of the software tool; and evaluation by experts. The developed model, the software tool and the result will be presented to technical experts and archivists. The evaluation will be carried out using an interview method.

The mapping of content is particularly important in the development of the model and the software application, as it must be accurate and allow users to reuse it on different records. The aim is to create a model and customize content mapping that will be useful for archival description in Slovenia.

RiC-CM and similar standards are challenging because of the different ways in which cultural heritage material is described and presented, but they also bring several benefits. »The process is not easy and needs to cover the most distinct realities of archives around the world. The description process will need to be adapted to reflect the graph way of thinking, allowing to archivists and systems to add relations between the elements that were not possible before. As consequence, these new relations will improve the records contexts of the archives« (Souza & Flores, 2021, 7).

As with any new technology, we need to be very critical of the introduction of RiC and involve the archival profession and the public in analysing the advantages and disadvantages of the new conceptual model and the way it works. In this process we can ask ourselves several questions, such as: What does RiC mean for our daily work? How does RiC affect the DUCAT[22] principles? Is RiC relevant for

---

22 Principles for long-term preservation of archival materials according to ZVDAGA (2006). Dostopnost – eng. Accessibility, Uporabnost – eng. Usability, Celovitost – eng. Integrity, Avtentičnost – eng. Authenticity, Trajnost – eng. Permanence.

users? Because of these and many other questions, we need as much research as possible to help us in the final decision and eventual implementation of the new conceptual model.

REFERENCES

Clavaud, F. and Wildi, T. (2021). ICA Records in Contexts-Ontology (RiC-O): a Semantic Framework for Describing Archival Resources. Lopes et al. (ed). *Linked Archives 2021*. Retrieved at https://ceur-ws.org/Vol-3019/LinkedArchives_2021_paper_ 13.pdf (accessed on 28. 2. 2024).

Creswell, J. W. (2009). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Cunha, D. A. (2020). *Evaluation of user interfaces for interaction with linked data in historical archives* (Doktorska disertacija). Porto: Faculdade de Engenharia da Universidade do Porto. Retrieved at https:// repositorio-aberto. up.pt/bitstream/10216/126818/2/392126.pdf (accessed on 27. 2. 2024).

Faria, C., Serra, I., and Girardi, R. (2014). A domain-independent process for automatic ontology population from text. *Science of Computer Programming, 95*, 26–43. Retrieved at https://doi.org/10.1016/j.scico.2013.12.005 (accessed on 15. 6. 2024).

Francart, T., Clavaud, F. and Charbonnier, P. (2021). RiC-O Converter: a Software to Convert EAC-CPF and EAD 2002 XML files to RDF Datasets Conforming to Records in Contexts Ontology. In C. T. Lopes, C. Ribero, F. Niccolucci, I. Rodrigues and N.Freire, *Linked Archives 2021*: *Proceedings of Linked Archives International Workshop 2021 co-located with 25th International Conference on Theory and Practice of Digital Libraries (TPDL 2021)* (pgs. 30–36). CEUR Workshop Proceedings. Retrieved at https://enc.hal.science/ hal-03965807 (accessed on 27. 2. 2024).

International Council on Archives (ICA). (2000). ISAD(G): General International Standard Archival Description, second edition (ISAD(G)2). Retrieved at https://www.ica.org/resource/isadg-general-international-standard-archival-description-second-edition/ (accessed in 20. 2. 2024).

International Council on Archives Expert Group on Archival Description. (2023). Records in contexts conceptual model (RiC-CM). Version 1.0. Retrieved at https://www.ica. org/resource/records-in-contexts-conceptual-model/ (accessed on 3. 9. 2024).

Koch, I., Teixeira Lopes, C., and Ribeiro, C. (2023). Moving from ISAD(G) to a CIDOC CRM-based Linked Data Model in the Portuguese Archives. *Journal on Computing and Cultural Heritage*, *16*(4), 1–21. Retrieved at https://doi.org/10.1145/3605910 (accessed on 28. 2. 2024).

Mikhaylova, D., and Metilli, D. (2023). Extending RiC-O to Model Historical Architectural Archives: The ITDT Ontology. *Journal on Computing and Cultural Heritage*, *16*(4), 1–15. Retrieved at https://doi.org/10.1145/3606706 (accessed on 26. 2. 2024).

Pitti, D., Stockting, B., and Clavaud, F. (2016). An introduction to "Records in Contexts": An archival description draft standard. *Comma*, *2016*(1–2), 173–188. https://doi.org/10.3828/comma.2016.18 (accessed on 20. 2. 2024).

Popovici, B. (2020). "Yet another one?!": some considerations on instantiation entity in 'records in contexts' model. *Atlanti+, 30*(2), 48–56.

Roke, E. R., and Tillman, R. K. (2022). Pragmatic Principles for Archival Linked Data. *The American Archivist, 85*(1), 173–201. Retrieved at https://doi. org/10.17723/2327-9702-85.1.173 (accessed on 20. 2. 2024).

Souza, M. V. and Flores, D. (2021). Applying Records in Contexts in a Federal University Record. In C. T. Lopes, C. Ribero, F. Niccolucci, I. Rodrigues and N.Freire, *Linked Archives 2021*: *Proceedings of Linked Archives International Workshop 2021 co-located with 25th International Conference on Theory and Practice of Digital Libraries (TPDL 2021)* (pgs. 114–121). CEUR Workshop Proceedings. Retrieved at https://ceur-ws.org/Vol-3019/LinkedArchives_2021_paper_15.pdf (accessed on 27. 2. 2024).

Uredba o varstvu dokumentarnega in arhivskega gradiva (UVDAG). (2017). *Uradni list RS*, (42/17).

Zou, Q. (2019). *The Representation of Archival Descriptions: An Ontological Approach* (Doktorska disertacija). Montreal: McGill University. Retrieved at https://escholarship.mcgill.ca/ concern/theses/rr172245f (accessed on 27. 2. 2024).

Summary

Describing archival material is one of the archivist's most important tasks and is done in accordance with archival standards and legislation. The description allows, among other things, the access and the linking of the archival material. Four standards are currently in use regarding archival description: General International Standard Archival Description, second edition (ISAD(G)2), International Standard Archival Authority Record for Corporate Bodies, Persons, and Families (ISAAR (CPF)), International Standard for Describing Functions (ISDF)2 and International Standard for Describing Institutions with Archival Holdings (ISDIAH). The question is whether these standards are still relevant today, especially in the light of the changes that have taken place in the last 20 years. In 2012, the ICA (International Council on Archives) established the EGAD (Expert Group on Archival Description) group, which was tasked with developing a unique standard that would integrate four existing standards. This standard is now known as Records in Contexts (RiC). The conceptual model of RiC (RiC-CM) is based on entities, attributes, and relations between entities. The main objects of RiC-CM are entities, which are represented in a hierarchical structure. At the root is the thing entity, because all other entities are kinds of thing. RiC and similar standards are challenging because of the different ways in which cultural heritage material is described and presented, but they also bring several benefits.

The main objective of the research is to develop a process for transforming existing archival records, produced according to the ISAD(G)2 standard, into archival records based on the RiC conceptual model. A case study is carried out on the units of description of the Tomos technical documentation, and a knowledge map is produced as a final result. In the case study, entities, attributes and relations are created and a unique identifier is assigned to each entity. It can be concluded that the model presented is appropriate and can be the basis for the creation of a software tool for the conversion of records. The mapping of content is particularly important in the development of the model and the software application, as it must be accurate and allow users to reuse it on different records. The aim is to create a model and customize content mapping that will be useful for archival description in Slovenia. The emphasis is on transformation to conceptual model,

because of better understanding. Ontology form and syntax is less user-friendly when compared to conceptual model. The transformation was presented from a data perspective and will be part of much more detailed PhD research.

The advantage of RiC and other standards based on Linked Data technology is that they can bring together cultural heritage records to provide comprehensive access for users, researchers and archivists.

As with any new technology, we need to be very critical of the introduction of RiC and involve the archival profession and the public in analysing the advantages and disadvantages of the new conceptual model and the way it works. For this reason, we need as much research as possible to help us in the final decision and implementation of the new conceptual model.

Typology: 1.01 Original Scientific Article