Developing Metadata Application Profiles

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Chapter 5
The Development Process of a Metadata Application Profile for the Social and Solidarity Economy

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ABSTRACT

This chapter presents the process of developing a Metadata Application Profile for the Social and Solidarity Economy (DCAP-SSE) using Me4MAP, a method for developing Application Profiles that was being put forth by the authors. The DCAP-SSE and Me4MAP were developed iteratively, feeding new developments into each other. This paper presents how the DCAP-SSE was developed showing the steps followed through the development of the activities and the techniques used, and the final deliverables obtained at the end of each activity. It also presents the work-team and how each profile of the team contributed for the DCAP-SSE development process. The DCAP-SSE has been endorsed by the SSE community and new perspectives of SSE activities have been defined for future enlargement of the DCAP-SSE. At the time of writing this chapter, Linked Open SSE Data is being published, they are the first examples of use of the DCAP-SSE.

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INTRODUCTION

The Social and Solidarity Economy (SSE) can be broadly defined as a type of economy in which the goals are different either from the ones of the market economy or from the state's (Lechat, 2007). Allegedly, these goals are neither centered in profit nor in individualistic needs. It is an economy that presents itself as a material and human alternative to a capitalist economy (Cattani, Laville, Gaiger, & Hespanha, 2009).

SSE organisations work with scarce resources, networking and partnerships appear as a highly relevant way of working, with potential for SSE organisations to gain visibility and attract funding, or to be able to work at scale.

A study by Curado Malta, Baptista, & Parente (2014) revealed that the SSE community is facing a global challenge: this community wants to implement interoperability solutions between their Web Based Information Systems (WIS)—to build a global SSE e-marketplace—and also among their WIS and external ones. This calls for a more universal interoperability solution, like the one provided by Linked Data. Linked Data is structured data that is standardized, reachable, relatable and manageable by Semantic Web tools (W3C, 2015). One key aspect of Linked Data is the relationships among the data. These allow not only relating and inferring relations among different datasets and data sources, as they also provide context to available data. One of the constructs that contributes to maximize the interoperability of linked data is the Metadata Application Profile (MAP) (Nilsson, Baker, & Johnston, 2009).

In the end of 2010 the Intercontinental Network for the promotion of Social and Solidarity Economy (RIPESS)[1] has created a task-force called ESSGlobal for the mapping of SSE organisations and for the development of interoperability among SSE organizations' WIS. After a study of the environment, its requirements and its internal and external constraints, Curado Malta & Baptista (2014) came to the conclusion that there was no Metadata Application Profile (MAP) that could serve the SSE community. Based on this study, in 2012 the ESSGlobal decided to develop a MAP for the Social and Solidarity Economy (DCAP-SSE). The first version of this DCAP-SSE was presented at the DC-2015 conference (Curado Malta & Baptista, 2015). ESSGlobal created a Webpage[2] in order to provide the SSE community with detailed information about the DCAP-SSE adoption. Currently the ESSGlobal task-force is lobbying the world SSE community for a broad adoption of DCAP-SSE. This article presents the development process of this MAP – the DCAP-SSE.

To develop a MAP is a complex task: it depends on many variables as the communities are all different and have very specific particularities and different needs, and the process can start in different stages (e.g. no databases at all, existent local relational databases, existent Web Based Information Systems). It is indeed difficult to systematize all these possibilities and define a path of action depending on them.

On the other hand a MAP is something that is not developed often, sometimes only once in a lifetime, there is little documentation on how to develop a metadata application profile (see Curado Malta & Baptista (2013c)) and very little systematization.

This paper has the goal to contribute to enriching the metadata community documentation on how a specific MAP, DCAP-SSE, was developed. This development was based on a method for the development of MAPs (Me4MAP), which was defined by the authors using a Design Science Research (DSR) methodological approach.

This article proceeds as follows: the next section presents the background of the process used to develop the DCAP-SSE; Section 3 presents the DCAP-SSE development process including the activities and techniques, how the activities interact, and the final deliverables at the end of each activity; Section 4 presents future research directions and the last section concludes.

BACKGROUND

The DCAP-SSE development work was framed in a PhD research project (Curado Malta, 2014) that resulted in the definition of a method for the development of Metadata Application Profiles - Me4MAP).

This project was based in a DSR methodological approach, with the framework defined by Hevner & Chatterjee (2010). The DCAP-SSE development work was the "experimental situation" defined by Hevner & Chatterjee (2010) to test the artifact under development - Me4MAP. The DCAP-SSE and Me4MAP were developed iteratively. This iterative development implied that the development of DCAP-SSE did not follow the last version of Me4MAP. Instead, the last version of Me4MAP resulted from this iterative process. The process started with a very preliminary version of Me4MAP based in the results of the state-of-the-art study (see Curado Malta & Baptista (2013c)). The development of the DCAP-SSE along with other inputs then informed the Me4MAP development process, for the first version of Me4MAP that then fed the DCAP-SSE development process and so on in an iterative way. The development of Me4MAP process has produced though, along time, two versions-in-progress and a final version:

- **Version 0.1:** Curado Malta and Baptista (2013b)
- **Version 0.2:** Curado Malta and Baptista (2013a)
- **Version 1.0:** to be published

In the first versions, the method was called Me4DCAP which stands for 'Method for the Development of Dublin Core Application Profiles'. Then the name was changed

to Me4MAP – Method for the Development of Metadata Application Profiles in order to make clear in the name the independence from any metadata vocabulary.

With Me4MAP, regardless of the version, a MAP development process should follow the Singapore Stages. The names of the stages come from the seminal document "The Singapore framework for Dublin Core Application Profiles" - see Nilsson et al. (2008). This framework defines the three first Singapore Components: Functional Requirements; Domain Model and Description Set Profile, mandatory, and the last two: Usage Guidelines and Syntax Guidelines, optional.

The following sections will present how the DCAP-SSE was developed: showing the techniques used in the DCAP-SSE activities and the final versions of the deliverables. These deliverables are presented in the document if they are simple to show, otherwise a URL with the information is provided.

DCAP-SSE Development Process

The development of DCAP-SSE followed the Singapore Stages. Each stage was composed by a set of activities:

- In the first stage we developed the Functional Requirements. Activities: (i) definition of the Vision Statement of the project; (ii) definition of the application context; (iii) definition of the high-level requirements; (iv) development of the use-cases model.
- In the second stage we developed the Domain Model. Activities: (i) definition of the Environmental Scan, and; (ii) definition of the Domain Model.
- In the third stage we developed the Description Set Profile. Activities: (i) Development of Pre-Description Set profile (which includes also sub-activities of development of the detailed domain model, development of the vocabulary alignment and definition of the constraints matrix); (ii) Validation in laboratory; (iii) Codification of the Description Set Profile; iv) Validation in Production.

According to Me4MAP, it is important that team members use a common vocabulary of key terms in order to avoid misunderstandings and improve communication (Booch, Jacobson, & Rumbaugh, 1999). For this reason, it is very important to build a Glossary and make it readily available to project team members. A MAP development work-team should be composed of people with different expertise, as defined in Curado Malta & Baptista (2013a); it can happen that one member can have more than one type of expertise, which gives further emphasis to the need of a common Glossary.

The results of the development process as well as the justification of the choices should be recorded. The development of the documentation of each process is fundamental since the documents produced will help some MAP users (such as app designers or programmers) to apply the properties and classes correctly to the specific context. It also ensures that future MAP developers understand the MAP development process that was used. In the DCAP-SSE development process, the work team was geographically dispersed. We used Skype to meet, a logbook on line to write the minutes of the meetings (http://potaopad.me – not available anymore) and a wiki (http://essglobal.org/essglobal/wiki/process) to record information, decision processes, open issues, or thoughts.

Work-Team Structure

The DCAP-SSE development work-team was composed of five members:

- **A SSE Organization Manager and SSE Project Manager:** According to Me4MAP, this work-team member has the profiles of application context expert and of project manager;
- **A SSE Researcher:** According to Me4MAP, this work-team member has the profile of application context expert;
- **A Data Modeler and SSE Manager:** According to Me4MAP, this work-team member has the profiles of system analyst and application context expert;
- **A SSE Expert and Semantic Web Developer:** According to Me4MAP, this work-team member has the profiles of application context expert and semantic developer;
- A System Analyst, Semantic Modeler, Technical Writer and PhD researcher according to Me4MAP, this work-team member has the profiles of system analyst, semantic modeler and of technical editor

The technical writer registered all the information of the process as well the specifications of the final delivery of the DCAP-SSE.

All members of the work-team can be considered final consumers of the SSE economy, thus they are also final users of the SSE Web Portals and/or SSE Informational Web tools.

The team had a person with a management profile; he participated in almost all the meetings and helped to maintain the unity of the work-team. During the process of development some other persons, according to their profile, led the group in meetings depending on the type of activity at stake.

Developing of the Functional Requirements

This activity includes the sub-activities of:

1. Definition of the Vision Statement of the project
2. Definition of the application context
3. Definition of the high-level requirements
4. Development of the use-cases model

Glossary

In multi-disciplinary teams such as the one, just presented it is even more important to build the glossary since there are many visions of the world that have to do with the background of each member.

The DCAP-SSE Glossary is published in the Wiki Page: http://essglobal.org/essglobal/wiki/gloss.

The glossary was developed throughout the DCAP-SSE development process. Each time there were doubts or misunderstandings of ideas or concepts, we introduced a new entry into the Glossary. The technical writer was responsible for the edits.

Vision Statement

As in any other project, it is very important to set boundaries in order to effectively scope the issues the project wants to address. The Vision Statement is published in the Wiki Page at http://essglobal.org/essglobal/wiki/mission:

The Vision Statement was written by the SSE Experts of the work-team, after a brainstorming during the first Skype meeting, where all the other members were present. The Vision Statement was updated later in the development process during the use-case model development. The development of cases made clearer the objectives of the DCAP-SSE.

The Project Manager led the work-team and all members participated.

Application Context

The application context is the Social and Solidarity Economy and the community of organizations that map their activities in Web Information Systems. Those are the users that will implement the MAP in order to publish data as Linked Open Data.

More details about the application context can be found in Curado Malta et al. (2014) and Curado Malta (2014) (in Portuguese).

The application context was defined by one of the system analysts.

High Level Requirements

The elaboration of the High-Level Requirements is the definition of a list of the functional and non-functional requirements expressed by the work team members. The High-Level Requirements are (also published in the Wiki Page http://essglobal.org/essglobal/wiki/high[3]):

- Person searching for SSE organizations
- Researcher looking for aggregate information on SSE
- Person searching for products
- SSE enterprise exchanges local information with the web
- Public Policy Maker makes a public call to buy from or hire SSE enterprises

To define these High Level Requirements the work team brainstormed on the types of things they would like to do with the SSE data. For example, the kinds of searches they would like to do or the kinds of filters they would like to have on the data. There was a period of brainstorming and in the end the ideas were written in the pontaopad.me. Finally, from there, a set of requirements was defined.

The System Analyst led the work-team and all members participated.

Use Cases Model

The process of defining the Use Cases Model had as its starting point the High-Level Requirements deliverable. These requirements are the starting point to thinking about the actions which are needed and the types of actors that will interact with those actions. The goal of this activity was to develop two different things: (i) The definition of the Use-Case Diagram, and (ii) The definition of the Detailed Use-Cases.

The Use Case UML Model summarises the actors and the actions, it is published on the Wiki Page: http://essglobal.org/essglobal/wiki/usecasemodel[4]. The work-team identified two actors:

- A standard final user that could be interested in information about a) SSE Organisations and b) commercial SSE products/services;
- An SSE Researcher interested in aggregated SSE data.

The work-team also identified three types of interactions between the actors and a Website, through three use-cases. Each use case was detailed using the template proposed by Schneider & Winters (2001, pp. 29). The three Use-Cases are [5]:

Case 1: Person searching for SSE Organisation: http://essglobal.org/essglobal/wiki/1
Case 2: Researcher looking for aggregate information on SSE: http://essglobal.org/essglobal/wiki/2
Case 3: Person searching for products: http://essglobal.org/essglobal/wiki/3

The System Analysts led the work-team and all members participated.

Functional Requirements

With the two deliverables previously defined, the work-team identified the Functional Requirements of DCAP-SSE (also published in the Wiki Page http://essglobal.org/essglobal/wiki/functional[6]):

- Facilitate the creation and sharing of consistent metadata
- Support the search of any or all elements: "SSEInitiative," "Network," "Product," "Sale Options" and "Product-Input" (Use Cases 1, 2 and 3).
- Search for any property of each element mentioned in the previous paragraph and also "Cost Composition" of any Product-Input (Use Cases 1, 2 and 3).

The System Analyst led the work-team and all members participated.

Developing the Domain Model

The work-team continued its work with two different activities that were done simultaneously: (i) the Environmental Scan, and; (ii) the definition of the Domain Model.

Environmental Scan

The Environmental Scan is a report that contains a review of the metadata schemas, RDF vocabularies or Ontologies (from now on referred to as vocabularies) that are available in any serialization of the Semantic Web (e.g. RDF/XML, turtle) and that may serve the needs of the Detailed Domain Model (see below). The environmental scan was one of the outputs of the study of the state-of-the-art presented in Curado Malta & Baptista (2014). The Environmental Scan is available as MatrixII and MatrixIII stored in the institutional repository of the University of Minho, accessible through the handle http://hdl.handle.net/1822/23412[7].

This activity was developed by the semantic modelers.

Domain Model

According to Baker & Coyle (2009) "a domain model is a description of what things your metadata will describe, and the relationships between those things". It identifies the entities and their relationships, while attributes (e.g., datatypes and other attributes with literal values) are detailed further in the development process.

The work team decided to use the UML class diagram notation to represent the domain model.

The system analysts led the team discussion on what kind of things the team would need to capture in order to be able to respond to the Functional Requirements previously defined. The process is similar to the one of modeling a relational database: entities that have attributes and participate in relationships. After defining the entities, the team defined the relationships between the entities. It was an iterative process and it took more than one meeting to arrive at a stable model. The Domain Model is published in the Wiki Page: http://essglobal.org/essglobal/wiki/uml[8]

The system analysts led the work-team and all members participated.

Developing the Description Set

The work-team continued its work with three different main activities that were done sequentially. Since the activities were complex the work-team broke them in sets of sub-activities:

1. Development of Pre-Description Set profile: this sub-activity is also complex therefore Me4MAP breaks it in another set of sub-activities (see below)
2. Validation in laboratory
3. Codification of the Description Set Profile

The following paragraphs will detail each of these activities.

Development of Pre-Description Set Profile

This work is divided in:

1. The development of the Detailed Domain Model: it is the deepening of the Domain Model, where the whole team defines the attributes of the entities of the Domain Model and some constraints over the attributes;
2. The development of the vocabulary alignment: it is a sub-activity where the semantic modelers look for terms (of vocabularies) that describe each entity and related attributes that are defined in the Detailed Domain Model;

3. The definition of the Constraints Matrix: it is a sub-activity where the semantic modeler has to define, for each entity, and for each attribute of the Detailed Domain Model, which term of the vocabulary alignment is the one that best describes the entity or attribute; the semantic modeler also has to define the possible constraints over the attributes. The Constraints Matrix of the DCAP-SSE format is a simple worksheet.

These sub-activities are detailed bellow.

Detailed Domain Model

This sub-activity deepens the Domain Model defining the attributes of the entities and also the constraints on the model's entities and attributes. A Detailed Domain Model is also known as Data Model. The work team used the ORM technique (Halpin & Morgan, 2008) to represent the data model.

The "semantic modeling approach views the world simply in terms of objects (things) playing roles (parts in relationships)" (Halpin & Morgan, 2008, pp.9). Semantic modeling is made of triples, very close to the natural language structure where sentences are as "subject verb and object"; a triple is defined as a statement of the kind "subject predicate and object". ORM is ideal to transform the informal description in natural language into a more formal one. ORM has a great advantage over UML or ER, it offers greater semantic stability. The System Analysts concluded that ORM is in fact the best way to model data that will be defined as triples.

The data model is published in the Wiki Page: http://essglobal.org/essglobal/wiki/dm[9]

The activity was led by the system analysts and all the work-team participated.

Vocabulary Alignment

The Vocabulary alignment defines the vocabularies that will be used by the DCAP-SSE, having as its basis of work the data model. The sub-activity consists of identifying which existent terms in the vocabularies of the Environmental Scan can describe the attributes of each entity of the data model. At the end of this process a table with names of the vocabularies and namespaces was defined (also published in the Wiki Webpage http://essglobal.org/essglobal/wiki/vocab_align[10]):

RDF vocabularies, metadata schemes, ontologies

DCMI Terms: http://www,purl.org/dcterms/
The friend of a friend: http://xmlns.com/foaf/0.1/
Good Relations: http://purl.org/goodrelations/v1

VCARD: http://www.w3.org/2006/vcard/ns
Organisation Ontology: http://www.w3.org/ns/org

Syntax Enconding Schemes (SES)

ISO 3166: http://purl.org/dc/terms/ISO3166

Vocabulary Encoding Schemes (VES)

TGN: http://purl.org/dc/terms/TGN

Every time a term from a vocabulary that conveniently expressed the semantics of a given attribute of the data model was not found, a new term was declared in a new vocabulary.

The new vocabulary is called ESSGlobal RDF vocabulary and is openly available through the IRI: http://purl.org/essglobal/vocab/[11]. The ESSGlobal RDF vocabulary technical documentation is available at http://essglobal.org/essglobal/vocabs/html/[12].

The Vocabulary Alignment was developed by the semantic modelers.

Constraints Matrix

The DCAP-SSE Constraints Matrix is published in the Wiki Page: http://essglobal.org/essglobal/wiki/_media/constraintsmatrixv1.0-final.pdf[13] This matrix is based in the table presented by Baker & Coyle (2009).

The terms "entities" and "attributes" are used when modeling the application context. The terminology changes to "classes" and "properties" in the implementation phase. The entities of the data model correspond to the classes of the implementation, and the attributes to the properties of the implementation.

The Constrains Matrix has two tables:

1. **Definition of Namespaces Used:** Identifies the Namespaces of the vocabularies used in DCAP-SSE;
2. **Definition of Description Templates:** Is comprised of a set of sub-tables defining the Description Templates of DCAP-SSE. Each Description Table corresponds to an entity of the data model – now class -, and each row of a Description Template corresponds to an attribute of that entity – now property. The subsequent rows of each Description Template define the properties of a specific class. There are data properties[14] (that relate an instance of a class to a literal) and object properties[15] (that relate two instances of different classes) on the Description Template. In order to simplify the process of creating the tables and their reference downstream, the work-team filled first the data properties followed by the object properties.

Every time there was the need to constraint a property to a set of terms and there was no Vocabulary Encoding Scheme (VES) on the Environmental Scan Report that could answer that specific need, the work-team decided to define a new VES. For every new VES it was necessary to brainstorm all the possibilities the term could have as value, and register it. The work-team defined the following five VES[16]:

- Economic Activities/Sectors: http://purl.org/essglobal/standard/activities
- Macro-themes: http://purl.org/essglobal/standard/themes
- Qualifiers: http://purl.org/essglobal/standard/qualifiers
- Type of Labour: http://purl.org/essglobal/standard/type-of-labour
- Legal form: http://purl.org/essglobal/standard/legal-form

ESSGlobal's VES technical documentation is available at http://essglobal.org/essglobal/vocabs/html/[17].

The sub-activity was led by the semantic modelers and all application context experts participated. The application context experts are key to the development of this sub-activity since they are the ones that have the knowledge of the application. The application context experts knew precisely what properties should be constrained, and how. The semantic modelers knew how to technically define the constraints but could not know how to define those constraints in terms of content. These two different roles interacted deeply during this activity.

Validation in Laboratory

Some tests were made after defining the Constrains Matrix. The idea was to understand if the work was correctly done, that is, if the data model could respond to the informational needs real users would have. The work-team identified a set of resources, from SSE Web Based Information Systems in Brazil, Italy, Spain and USA, that constituted a trustworthy sample of the application domain of the DCAP-SSE. These SSW WIS were the ones identified by the SSE Experts as being the ones with better mappings of the SSE Economy in the World. These mappings have been developed over the last seven years. Others may exist but do not have mappings so advanced and organized, or are not, in fact, the core of the SSE[18]. The SSE WIS are[19]:

- **Brazil – Cirandas:** http://cirandas.net_
- **Italy - GoFair:** http://go-fair.eu_
- **Spain - Mercado Social:** http://mercadosocial.konsumoresponsable.coop_
- **Spain - Mercado Social Madrid:** https://madrid.mercadosocial.net/_
- **USA - Solidarity Economy US:** http://solidarityeconomy.us_

The work-team identified one to four resources per SSE WIS. The identification of resources had the concern of choosing resources that had enough information to be described, the more detailed the better. There was also the concern to choose resources that were different from each other in order to explore the most of the data model that was being tested. In total seventeen resources were chosen.

The work-team defined a worksheet template[20], based on the Constraints Matrix in order to collect and organize the data. It proceeded as follows:

1. For each resource the worksheet was filled with the specific information of the resource;
2. For each worksheet, the work-team encoded the information in turtle and in RDF/XML and created the graphs with the W3C RDF validator[21];
3. If there was information on the resource that could not be expressed with the properties or encoding schemes defined on the Constraints Matrix, the process would iterate, i.e, the work-team had to go back to the definition of the Domain Model or the definition of the Detailed Domain Model, or even to the definition of the Functional Requirements. That, in fact, never happened as all the resources could be fully described with the information defined on the Constraints Matrix.

The validation in laboratory is published in http://www.essglobal.org/essglobal/howto[22].

This activity was developed by the semantic modelers with some help from final users since they were the ones that have chosen the resources for the validation.

Codification of the Description Set Profile

The Codification of the Description Set Profile (DSP) was straightforward having as basis the Constraints Matrix and the primer of DSP (see Nilsson (2008)). The DSP file is available at http://purl.org/essglobal/dsp-xml[23].

This activity was developed by the semantic modelers.

Validation in Production

A very simple first implementation of DCAP-SSE was set. This implementation only uses the “SSE Organization” and “Address” classes of the Go Fair[24] SSE WIS. The implementation was straight forward and had no issues. GoFair is implemented as follows:

1. An SSE Organization is identified with an ID in the SSE WIS as follows: http://www.go-fair.eu/#/organisation/ID[25]
2. The server has the organization data available in Turtle via the IRI http://app-gofair.rhcloud.com/api/app/negozi/ID/rdf[26]

The programmer of the SSE WIS implemented the DCAP-SSE with the support of the project manager and semantic modelers.

Since the RIPESS-ESSGlobal task-force expects to have many top SSE world organizations interested in the implementation of the DCAP-SSE, they asked the work-team to work on a "How To" Webpage in order to help future DCAP-SSE implementers. This "How To" Webpage[27] uses the seventeen cases of the Validation in Laboratory. Every case is detailed as follows:

1. Presentation of the resource in natural language;
2. Building of a table with the triples;
3. Presentation of the detailed explanation of the Turtle code, step by step;
4. Presentation of the detailed information in graphs, also step by step;
5. At the end of the page the whole code is provided in a Turtle file, as well as an image file with the whole graph, both openly available for download.

The RIPESS task-force expects to monitor and support more validations in production in the future as the SSE community is willing to use the DCAP-SSE.

FUTURE RESEARCH DIRECTIONS

The development of DCAP-SSE was the experimental situation of a DSR project aimed at putting forth a method for developing MAPs: Me4MAP. The DCAP-SSE and Me4MAP were developed iteratively.

In terms of DCAP-SSE future work:

1. The RIPESS-ESSGlobal task-force wants to continue the tests in the future with more resources, especially the ones that are not the core of SSE.
2. The RIPESS-ESSGlobal task-force hopes to enlarge the scope of DCAP-SSE without losing the first original purpose of serving the SSE Community. The idea is to develop extensions to the first DCAP-SSE version to integrate all activities in the same model. By doing so the SSE LOD cloud would be of an interesting dimension to empower the local, regional, national and transnational SSE communities.

In terms of Me4MAP future work:

1. Study and integrate in Me4MAP other software development approaches, such as the ones related to "agile methods". We want to study what is being done in this area (e.g. Ochiai, Nagamori, & Sugimoto (2014)) in order to propose a future version of Me4MAP that integrates these approaches. This future version will not necessarily replace the current version of Me4MAP; the two approaches may stand side-by-side for use in different settings.
2. Me4MAP is in the validation phase - we want to continue to validate the method in different settings in order to address the question of its generalizability. In fact, we think that Me4MAP may be adequate in a context similar to the one used in the SSE community. However, it's important to determine the conditions of its generalizability and the limits of its applicability.

CONCLUSION

This chapter presents the process of developing a Metadata Application Profile for the Social and Solidarity Economy (DCAP-SSE). The Social and Solidarity Economy (SSE) is a type of economy that is different from the one of the market economy or state. Although having similarities with these two types of economy, the SSE has very specific characteristics. Examples are:

1. The SSE networks that exist that produce common goals, products or services, and
2. The need to present an open price that explains how the final price of a product or service is build.

This community wants to publish the data that is trapped in silos of information on the Web of Documents (the common Web that we, as humans, access every day) as Linked Open Data, and then be able to use each other's data, or to build more sophisticated software in order to show actually the dimension of the SSE economy in the world. This was the motivation for the development of a metadata application profile.

This MAP development was integrated in a PhD project that had as main goal to define a method for the development of metadata application profile (Me4MAP). The development of the DCAP-SSE was used as test for Me4MAP definition, in an intensive iterative process.

This chapter shows the steps undertaken to build the MAP. Since Me4MAP defines a set of activities and the flow of these activities, and the deliverables that

should be developed along the process, the chapter presents how the flow happened, and describes how the deliverables were developed.

The authors continue to undertake activities of research to improve Me4MAP. At the time of writing this chapter there is one important activity of validation occurring within the context of a research project[28] that is developing a MAP for European poetry (see Curado Malta, Centenera, & Gonzalez-Blanco (2016)), a completely different context, in terms of content and starting point, then the context of the SSE.

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KEY TERMS AND DEFINITIONS

Data Model: The same as Domain Model.

Domain Model: A conceptual model that describes certain aspects of a domain of knowledge. The model has concepts of the aspects of the real world that need to be modeled. These concepts include the data to be modeled and business rules in relation to the data. Conceptual models can be represented in different notations like Entity-Relationship Model or Unified Modeling Language, among others.

Entity: The conceptual model captures concepts in a domain. Concepts are called Entities when using the notation of Entity-Relationship Model. Entities are types of things that are part of a same group and that have the same characteristics, like “client” in a business that sells products or services, or “student” in a School, or “book” in a library.

Functional Requirements: A function of the system that will be modeled, the type of "things" the user or machine will do with the system.

Me4MAP: A method for the development of metadata application profiles, it establishes which activities to develop, when these activities may take place, how they are interconnected and which artifacts these activities produce.

Property: The common things of an entity, like "address," "name," "surname," "date of birth" of an entity "client," or "number of student" of an entity "student" or "title" of an entity "book".

ENDNOTES

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2 See http://essglobal.org/dcap-sse/ - accessed May 25, 2016)
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