Towards an account for dealing with documents in DEMO Method

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Abstract. This paper introduces an on-going research that seeks a combination between the Organizational Engineering (OE) approach and the Theory of Document Acts (D-Acts). The motivation for such research is the possibility of improvements in DEMO Method from the application of tenets formulated in Document Acts Theory and D-Act ontology. Even though DEMO is already a consolidating method, we believe that it could benefit to deal with documents, especially document that register rights and obligations. In order to reach our goals, we present a brief background about DEMO Method, Document Act Theory and d-act ontology. We present our methodological approach wherein we introduce the scenario of the model application. Finally, we introduce the steps for the model development. We advocate that our approach could be valuable, once it implements document act theory in DEMO Method.

Keywords: Document Acts Theory, D-acts Ontology, DEMO Method, Organizational Engineering

1. Introduction

DEMO is a method that aims to develop ontology models for construction and operation of organizations [1], [2] .It is independent of the actual implementationand focuses on communication patterns between human actors. DEMO assumes that communication between human actors is a necessary and sufficient basis for a theory of organizations. Apart from the organization-engineering domain, DEMO is also being used in contexts of Business Process Redesign (BPR) and Information Systems Development (ISD) [1], [2], [3].

The DEMO method has been developed under the Enterprise Ontology theory. This strong theoretical foundation ensures that DEMO models can be claimed to be formally correct [1], [2] as well as [4] coherent, comprehensive, consistent, concise and essential. The Enterprise Ontology theory comprehends of four axioms called: Distinction, Production, Composition and Transaction and one Theorem.

This paper introduces an on-going doctoral study that aims to matching the organizational aspects of DEMO Method with Documents Acts Theory and its respective ontology, called D-acts ontology. The motivation for this investigation is the expectation of contributing to the DEMO Method with theoretical improvements, by dealing with documents through documents acts theory -. Such a seek of improvements aims to further consolidate new findings regarding DEMO Method.

The remaining part of paper is organized as follows: in section two we present the research problem and related works; section three introduces a theoretical Bbackground that enables one to understand our approach, described in sections ahead (3.1, 3.2and 3.3). In section four we introduce our methodological approach describing the scenario of application and the steps taken. Finally, in Section five, we introduce some discussion about our approach and present final remarks about our investigation.

2. Problem and Related work

Our motivationstems from the fact that - although the ontological models DEMO are consistent, comprehensive, consistent, concise and essential - the current approaches seem to lack for a robust implementation for dealing with documents. We focus on the perspective that the interpretation of documents – as it ismade by social beings – leads to fulfilling the commitments formalized by the very same documents that encompass those commitments.

A co-related investigation about DEMO Method [15], which also approaches documents focus on the development process in the D-Organization abstract level. The main issue is the modeling path of D-Organization for two functions, namely: (1) archiving documents, in which the I-actors participate in transactions with D-actors that aim to treat original or derived facts; and (2) providing documents, in which the stored facts can be provided to I-actors after some transformation. In addition, there are others relevant approaches to dealing documents [18], [19], [20] and [21] in DEMO Method.

We do not take the same approach, but develop another view for documents within DEMO. This view focuses on facts formalized in documents, as well as in the social effects that come up with from the use of documents. We tell this social effects the acts of documents, or d acts,. Thus, indeed, documents formalize commitments.

In addition, the notions of Ontological Meta-model and Model used in DEMO model was taken from G.O.D. (Generation, Operationalization & Discontinuation) and Control (sub) organizations: a DEMO-based approach for continuous real-time management of organizational change caused by exceptions [16].

3. Theoretical Background

The theoretical background that we shall present has primarily almost the same disciplinary theoretical roots, namely Speech Act Theory developed by Austin and Searle. However, we present it in two distinct perspectives: (a) Organizational

Engineering, under which DEMO Method has been developed and, (b) Document Acts Theory , under which D-acts ontology has been developed. The following sections present both theories: sections 2.1 introduced DEMO Method; sections 2.2 introduces Document Act Theory; and section 2.3 describes main aspects related to D-acts Ontology.

Although the theoretical background of DEMO Method is too relevant and discussed in depth in the ongoing aforementioned PhD thesis , we present here a brief overview in which our research has been connected.

3.1. The scope of DEMO Method

The DEMO Method has been developed as a general method to be applied into a variety of contexts in different organizations. The theoretical background underlying DEMO is called Ψ-theory. According to Ψ-theory, the principle that governs the organization behavior is the commitment between actors – employees, customers, suppliers – that act to develop products or services. Such tasks are performed as a collaborative endeavor [1], [2] [3] and [4]. Within DEMO, the collaboration between actors is called Transaction.

Ψ-theory encompasses four axioms: Operation, Transaction, Composition and Distinction; as well as a Theorem [4]. Even though the theoretical aspects already mentioned are required for a complete understanding of the method, we present here only those aspects relevant for the purposes of the present paper.

According to the Operation Axiom [1], [2], [4] and [16], an organization is comprised by actors performing roles, which are endowed with authority and responsibility. In performing such roles, the individuals perform two kinds of acts: i) Production Acts (the so-called P-acts), which come up with effects in the Production World producing both goods and services; ii) Coordination Acts (the so-called C-Acts), which have effects in the Coordination World and occurs when individuals accomplish commitments made in order to fulfill Production-Acts. Each one of these worlds can be considered as a set of effects or facts produced by actors.

As a result, these acts end up in Production Facts (P-Facts) and Coordination Facts (C-Facts). A Production Act is inherently material or immaterial [16]. A C-Act is performed by a Performer (actor) and directed to a Addressee that receives the same act. A C-Act consists of two simultaneous acts; i) an intention in which the individual who performs the act declares her "social attitude"; such attitude could be a request, a promise, a declaration, an acceptance, and so forth; ii) a proposition act, in which the individual who declares the act also declares the time associated to the intention, resulting in a Coordination Fact (C-Fact) [1], [3] and [4].

Actors interact each other in order to create or deal with C-Facts. The way of interaction among actors can be between an actor and another actor, or can be between an actor and the world. This explains the principle employed by actors to deal with their set of commitments within the organization. Firstly, one can see the P-Facts that contribute to the organization goals, since they provide products and services to the organizational environment; secondly, one can see the C-Acts that represent the way in which actors agree and accomplish their commitments, with the aim of reaching certain P-Facts [4].

The Transaction Axiom, according to the Ψ-theory, demonstrates that C-Acts follow a general universal pattern, the so-called Transaction [3]. Two actors – the initiator and the performer – agree about an intended result for a transaction, which corresponds to the P-Fact created by a performer [1], [4], [5] and [16]. A Transaction evolves three phases: i) the phase O is triggered by an initiator request; ii) in the phase E, the performer performs the production; and iii) in the phase R, the initiator and the performer agree about the generated P-fact. Only through such agreement, a P-Fact can come about [1]

These sequences of transaction patterns show us that all transactions occur through four Coordination Acts (namely, social commitments): requests, promises, declarations, and acceptances. It is noteworthy that such acts can be tacitly performed, without any explicit communication [4].

3.2. Essentials of Documents Act Theory

Before to take our approach to the D-Acts Theory, we clarify which kind of document and which perspective we consider in our investigation. It is beyond our goals here to present an exhaustive exploration approach of the documents. This is a theme that has been approached since some time and under different perspectives. For example, in the 19th century by Documentation Science, in the middle of 20 century by Archival Science, Information Science and Computer Science [12].. The theme is still studied with different goals. Then, we believe that any attempt to provide a unique definition for documents could take us to misunderstandings.

Then, we assume a view of a document as an entity that lasts over time within the social context. We also consider that documents are entities that have its own existence, independently of people involved in their creation [7].

We are here interested in the phenomena that take place within organizations from the use of documents. we are neither interested in problems related to the semantic meaning of documents, nor with any particular form of communications that could be used. Indeed, we are concerned with the effects that documents can cause in certain contexts.

We approach documents through the perspective of document-acts. The theoretical basis for documents-acts arose in the middle of 20th century from Philosophy of Language, defending that languages can be used to make things and not only to provide a simple description of reality. Smith (1952) presents a theory of document-acts as an extension of the theory of speech-acts developed by Austin (1911-1960) and improved by Searle (1932).

The theory of document acts [10] shows how documents can be used to cause a variety of effects. Speech is evanescent, but documents are entities that endure throughout time. Furthermore, they can be preserved, inspected and modified in successive points in time, as well as grouped together into other complex documents.

The notion of intentionality [12] [14] is the key to clarifying the connection between speech-acts and document-acts. Intentionality is a very complex notion and a technical term in Philosophy. It means the power of minds to be directed towards a goal or a thing [12].

The role of intentionality considers that, in certain circumstances, documents

record information required to perform actions [12]. Such circumstances are associated with the official usage of a document. The function of a document defines it in the context of playing a certain role. To specify the function of a document it is necessary to specify its use, the kind of action in which it plays its role. Such general types of action are named practices, which are actions reflected in their instances. This means that in order to instantiate a practice, one needs to know how to do it [12] and [14].

In the context of their official use, documents acquire the capacity to concretize the relevant kinds of human intentionality, to occupy the relevant kinds of roles within larger corporate wholes, through which the actions of countless individuals become coordinated [7] and [12].

The document acts theory is not limited to providing evidence or information from documents, but they have social and institutional powers (legal, ethical) called deontic powers [10]. Document acts play an essential role in many social interactions and can unite people, groups or nations in a lasting way.

According [7] and [8] with a document we can fill it in, sign it, stamp it, inspect it, copy it, file; we can establish collateral, create an organization, record the deliberations of a committee, initiate a legal action, release funds, confirm flight readiness); we may fail to achieve the corresponding ends (because of error, forgery, falsification, or invalidity of a document, or because of challenge by an addressee or by some cognizant official).

Furthermore, there areinstitutional systems to which documents belong: marriage, law, government, commerce, and so on; the provenance of documents, i.e., the different sorts of ways in which documents are created as products of document acts of special sorts, as when documents with deontic powers are created through an official act of printing in a parliamentary digest [7] and [8].

These new practices bring documentary changes in social relations, they also bring new social artifacts [7], such as receipts, money, identity documents, criminal records, signatures, templates of documents, checks, official seals, bank accounts, contracts, shares, mortgages, liens, insurance policies and credit cards and so on [6], [8]. Thus, documents allow human beings to commit themselves to ever more risky and ambitious collaborative endeavors. [7].

Document acts [10] do not work in isolation from speech acts. The success of a document act will depends on the conditions involved in speech acts of the traditional sort: the person who fills the document has to have the authority to do so; she has to do so with appropriate intentions, in the appropriate sorts of contexts, and so forth [10].

In addition, the theory of document-acts makes use of the theoretical principles of speech-acts theory considering that, when a speech-act is performed, there is also the creation of certain institutional facts [12] [14]. In this case, we are close to the concept of constitutive rules developed by Searle (1962) and presented [12]. These rules allow one to know, for example, how an utterance can give rise to an obligation to a person that makes a promise, insofar as this promise impacts in the people´s behavior. In the presence of rules like this, certain activities are performed.

In order to allow the practical use of the document act theory, some level of formalization is required.In the next section, we present the formalization described in [10]. .

3.3. Documents Act Ontology Formalization

In this section we provide an implementation to Documents Act Ontology (D-acts ontology), which is based on the theory of document acts, in Web Ontology Language (OWL) (W3 Consortium 2004). Before to do so, it is useful to briefly describe the top-level ontology that grounds D-acts ontology, namely, the Basic Formal Ontology (BFO), as visualized [9].

The Basic Formal Ontology (BFO)[1] is a top-level ontology created in 2002 to describe domain independent entities, namely, meta, general and abstract entities [9]. The BFO was developed to represent top-level categories present in ontologies developed in all knowledge domains [9].

The BFO embraces a view of reality that encompasses entities called continuants and occurrents. Continuants are entities that endure through the time, as for example, objects, qualities and functions. Occurrents are entities that unfold through time with the participation of continuants [9]. Continuants and occurrents have different modes of existence: while continuants are subject to frequent chances, occurrents depend on continuant entities to be their bearers.
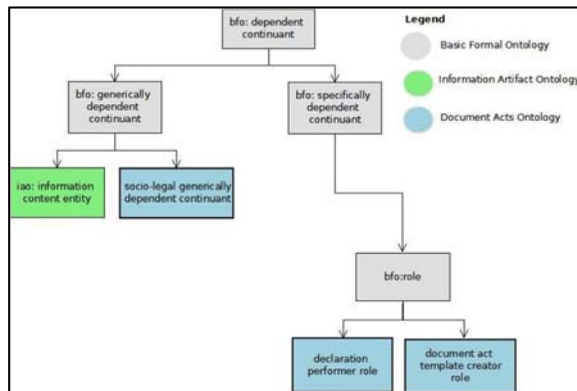

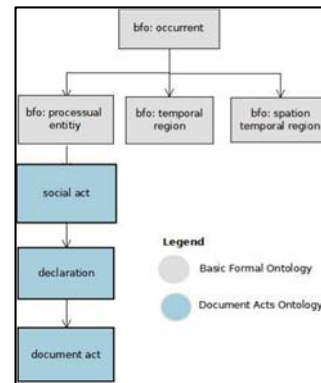Figure 1: D-act hierarchy in BFO - Continuant

Figure 2: D-act hierarchy in BFO - Ocurrent

In order to represent document acts it is necessary to be able to track specific roles and their bearers involved in the document act: i) the creators of the document template; ii) the users of the document; iii) the target bearers of the concretizations of social entities, namely Socio-Legal Generically Dependent Continuant (CDGLS), created by document acts.

The following entities had been implemented in the initial version of the Document Act Ontology (d-acts) [9]. The following notations are used: **classes** are written in bold, *object properties* are written in italics, and OPERATORS are written in capital letters.

Socio-legal generically dependent continuant - Def.: Socio-legal generically dependent continuants are generically dependent continuants that come into existence

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[1] BFO reference Manual http://www.ifomis.uni-saarland.de/bfo/

through declarations and are concretized as roles. They differ from information content entities in that they are not about something, but exist as quasi-abstract social entities. In addition, their concretizations are not qualities inhering in independent continuants, but roles borne by an organism or an aggregate of organisms. Each socio-legal, generically dependent continuant can only be concretized once at each given time.

Equivalent class: *is_specified_output_*of SOME **declaration** .
Superclass: **generically dependent continuant.**

Examples: the claim of a piece of land, the obligation to pay rent to the owner of a rental property

Social act - Def.: A process that is carried out by a conscious being or an aggregate of conscious beings and is spontaneous, directed towards other conscious beings and aggregates thereof and needs to be perceived.

Equivalent class: -
Superclass: **processual entity**
Example: Colonel Klink giving Sergeant Schultz an order, Jake promising Jill to take her to the junior prom

Declaration Def.: A social act that brings about, transfers, or revokes a socio-legal, generically dependent continuant. Declarations do not depend on words spoken or written, but sometimes are merely actions, for instance the signing of a document.

Equivalent class: (*legally revokes* SOME **socio-legal generically dependent continuan**t) OR (*legally transfers* SOME **socio-legal generically dependent continuant**) OR (*has_specified_output* SOME **socio-legal generically dependent continuant**) AND *has_agent* SOME ((**Homo sapiens** OR **organization** OR **collection of humans** OR **aggregate of organizations**) AND *bearer_of* SOME **declaration** performer role) AND *realizes* SOME **declaration performer role**
Superclass: **social act**

Examples: my consenting verbally to buy a used TV set for $500, Jane Doe's signing of the divorce papers, John Robie's taking of Mrs. Steven's jewels.

Legally revokes - Def.: d socio-legally revokes s if s participates in d, and at the end of d, s no longer exists. It is important to note that this going out of existence of s is complete and unlike the going out of existence for material entities, which basic- ally always are transformed into something else. After the declaration nothing is left of the socio-legal, generically dependent continuant in question.

Domain: **declaration**
Range: **socio-legal generically dependent continuant**
Super property: *has_participant*
Characteristics: Functional, Asymmetric, Irreflexive

Legally transfers - Def.: d socio-legally transfers l if l participates in d and d has specified input (concretization of l_1) and specified output (concretization of l_2), where (concretization of l_1) and (concretization of l_2) are not identical.

Domain: **declaration**
Range: **socio-legal, generically dependent continuant**
Super property: *has_participant*
Characteristics: Functional, Asymmetric, Irreflexive

Document act Def.: A declaration that is made using a document to temporally extend the effects of the declaration.

Equivalent class: (*legally revokes* SOME **socio-legal, generically dependent continuant**) OR (*legally transfers* SOME **socio-legal, generically dependent continuant**) OR (*has_specified_output* SOME **socio-legal, generically dependent continuant**) AND *has_agent* SOME (**Homo sapiens** OR **organization** OR **collection of humans** OR **aggregate of organizations**) AND *has_specified_input* SOME **document** AND *has_specified_output* SOME **document**)

Superclass: **declaration**

  Examples: filling in an immigration form, a judge signing and stamping a court order

declaration target: Def.: The human being or organization or aggregate of any of the aforementioned that is the bearer of a concretization of a socio-legal, generically dependent continuant brought about by or transferred in a specific document act.

Equivalent class: (**Homo sapiens** OR **organization** OR **aggregate of organizations** OR **collection of humans**) AND bearer_of SOME ((is_concretization_of SOME **socio-legal, generically dependent continuant**) AND participates_in SOME **declaration**)

Superclass: Superclass: **processual entity**

Examples: me as bearer of a spouse role who participates in a document act, John Doe as bearer of a debtor role who participates in a document act

Declaration performer role - Def.: A role inhering in a human being or an organization or an aggregate of any of the aforementioned that is realized by the bearer being the agent in a declaration.

Equivalent class: -

Superclass: **role,** *inheres* in SOME (**Homo sapiens** OR **organization** OR **aggregate of organizations** OR **collection of humans**) AND *is_realized_by* ONLY **declaration**

  Examples: a judge's role of signing a court order, a hospital committee's role to sanction conformance to a specific guideline for hospital employees

Document act template creator role - Def.: A role that inheres in a human being or organization or aggregate of any of the aforementioned that prepares a document that is the specified input to a document act and is the input document of a document act.

Equivalent class: -

  Superclass: **role,** inheres in SOME ((**Homo sapiens** OR **organization** OR **aggregate of organizations** OR **collection of humans**) and *is_realized_by* ONLY (**process** AND *has_specified_output* SOME (**document** AND *participates_in* SOME **document act**)))

Examples: the role of the U.S. Citizenship and Immigration Service realized by the creation of an immigration form being filled in, the role of a national professional association realized by the creation of a clinical guideline to be certified

   There are other relevant terms from BFO that are required to a proper understanding of D-acts. But, here we do not describe all BFO and D-ACT terms, but they are deeply discussed in author thesis. Is important here is that, even though in principle DEMO and D-acts have employed different points of view to represent the reality, both exhibit similar theoretical grounds. Thus, we propose to perform a merging between the underlying principles of each one.

4. Methodological proposal

It is noteworthy that the present study is an ongoing research performed in the scope of a PhD thesis. At the end of thesis, we hope to have created a complete match between these theories, and then more concrete results become possible. To achieve our goal, and to answer to the problem of research that we propose to investigate, we developed our methodological proposal based on Design Science Methodology.

Thus, this paper describes the design of an artifact, an Object Fact Diagram, consisting of the specification of a Document Act Ontological Model (D-ACTOM). This model has been developed to be the bridge between DEMO Method and Document Act Theory.

Our approach was developed from the analysis those theories that underlies DEMO Method, Document Act Theory and D-ontology acts. We are investigating how we would correlate these theories in order to find out a merging of their foundations. We are looking for possible improvements that could be added to DEMO, both in theoretical studies and in practical applications.

Once the design science research requires the use of rigorous methods in artifact design process, our approach follows a rigorous process in which we used theoretical foundations of philosophy, of information systems modeling and of DEMO method.

We expect that the design artifact we are developing enables a solution to the aforementioned research problem and extends the already solid, but open to improvements, DEMO method and its knowledge base..

As part of our methodological approach, we applied our model into a real context in order to evaluate it. The results have been fruitful as one can see in our finding showed in following sections. In next section (section 4.1) we present the scenario of model application; in section 4.2, we present both all the developed steps for Document Act Ontological Model (D-ACTOM) and how it has been applied according to an specific scenario.

4.1. The scenario of model application

In healthcare branch, documents carry extensible economic and medical entailments. Healthcare institutions have documents of numerous sorts, including management, regulatory, legal and technical documents [17]. Indeed, there are uncountable kinds of medical documents, which are complex instances employed for several purposes in healthcare processes. The documents we are interested refer to documents that carries out important functions, that is, documents that are able to perform document acts.

One example of this kind of document is the **consent letter**[2], a document that legally enables the process of blood drawing. This document is required in several countries for all people in the need of blood drawning as medical treatment for a diagnosed medical condition, including those ones with genetic predisposition to iron

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[2] A template consent letter for blood drawing of a specific treatment can be downloaded in
   http://www.psbc.org/patient/polycythemia /

overloading (hereditary hemochromatosis, or HH). Thus, a consent letter is the specified input of a document act that represents the desire of any patient in consenting that their blood be drawn.

In this context, the clerk, who is responsible for the blood drawing process (see in d-act ontology, section 3.3) is the bearer of the document act template creator role. The blood-drawing patient is the bearer of the declaration performer role. A nurse is responsible for medical procedures that enabling the patient to draw blood, for instance, blood drawing from the patient's arm. She is - the declaration target (see d-act ontology), since she becomes endowed with the right to perform the aforementioned procedures [10] and [15].

The figure 3 presents an overview about our scope. The scope of interest refers only to the moment in which the patient provides the consent, and also signs the consent letter. Thus, we can reach an ontological model that represents the blood drawing consent, from a particular Blood Bank. In Organization Construction Diagram (OCD), one can find: i) *Transaction T01 - blood drawing consent realization* in which the patient (verbally) consents the procedures for drawing her blood; and ii) *Transaction T02 - blood drawing consent letter signing*, which represents the consent letter to be signed to the legal allowance regarding blood drawing. Then, only after these transactions have been carried out, the clerk or nurse responsible by the task can collect the patient's blood. So, the nurse receives the patient's consent letter and then she verifies if the consent letter has been filled and signed. Thus, she can legally fulfill the commitment to her role within the organization.

Figure 3 presents the State Space Diagram (SSD) in which the PATIENT *class* contains the population of patients who needs blood to be drawn as treatment. The CONSENT *class* contain all consents uttered by patients from PATIENT *class*, that is, who declares the social intention, namely, the consent to draw blood. In this context, we can notice the following sentence predicate for binary fact types: *[blood drawing consent] of [patient #111]* in which the patient #111 verbally consents to draw her blood. The result of the transaction is also represented by the sentence predicate for the dependent fact type: R02 - *[blood drawing consent letter # 235] was signed* in which after uttering the consent, the patient fills and signs the consent letter allowing one to draw her blood.
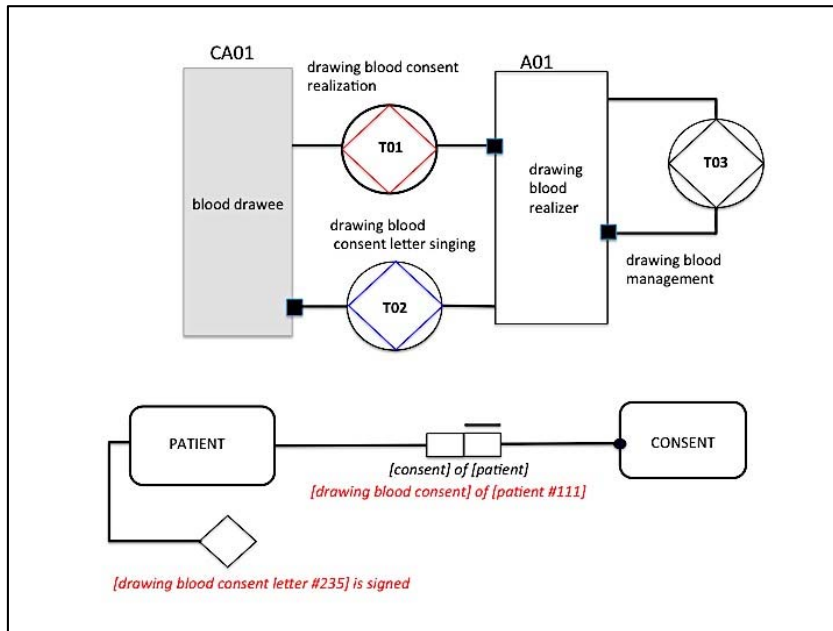
Figure 3: Blood Drawing Consent: Organization Construction Diagram (OCD) and State Space Diagram (SSD)

4.2. The steps of the model development

The Figure 4 presents our **Document Act Ontological Model (D-ACTOM)** that has been modeled in DEMO Method. The first step of model development was to identify the entities of Document Act (D-act). The essence of the D-acts is the declaration entity whose facts are formalized in the (physical) document in which the purposes of that declaration go to last over time.

From this perspective we present (FIG. 4) in the top left of figure 4, the TRANSACTION KIND *class*, which represents transactions whose results are facts of the world, for example, social declarations such as consents. Consent is a declaration type often used in many fields as healthcare, in which one can find, for example: i) a family consent to donate organs of a dead person ; ii) someone consenting surgical procedures and, , iii) a patient consenting to draw her blood, in our scope of interest, represented by the transaction *T01 - blood drawing consent realization,* a instance of TRANSACTION KIND *class* (as shown in figure 4).

At left of… the D-ACT KIND *class* represents all kinds of actions at datalogical level. These actions are necessary for registering a declaration type of TRANSACTION KIND *class* in D-ACT *class*. In our scope of interest one can perform different acts: **1** - generate: the action performed by the actor role who is responsible for generating the blood drawing consent letter; **2** - hand-over: the action wherein the performer that generates the blood drawing consent letter delivers it to

addressee (patient) who will fills it out; **3** - fill: the action in which the addressee (patient), who received the blood-drawing consent letter fills it; **4** - sign: the action of signing the blood-drawing consent letter by the performer (executor - patient) of transaction. Hand-over is also the action in which the performer (patient), after signing the blood drawing consent letter, delivers it to addressee (nurse) of the transaction.
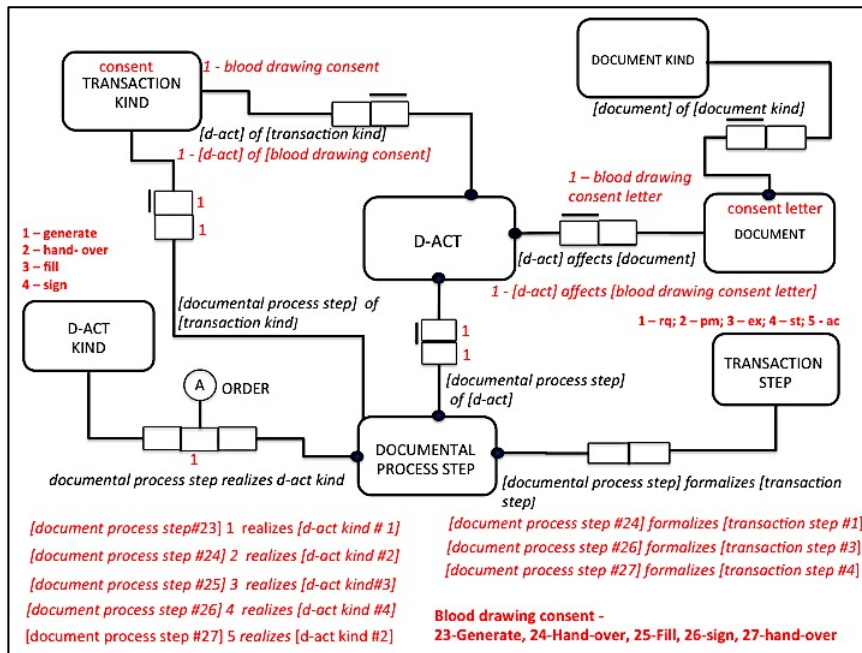

Figure 4: Document Act Ontological Model (D-ACTOM)

At the bottom center of figure 4, the DOCUMENTAL PROCESS STEP *class* specifies each step – at datalogical level – needed for registering each declaration in D-ACT *class*. Thus, the DOCUMENTAL PROCESS STEP *class* exists to tell one that, a certain d-act kind records a certain transaction step. The TRANSACTION STEP *class* specifies the steps required for each transaction from TRANSACTION KIND *class*. Each step of TRANSACTION STEP *class* received an identifier, as follows: 1 - rq; 2 - pm; 3 – ex; 4 - st and 5 - ac.

In the scope of interest (FIG. 4), for registering the consent for drawing blood, one can identify the following transactions: *T1– blood drawing consent realization* and *T02 - blood drawing consent letter signing.* The instance 24 means the request action is realized by one hand-over; the instance 26 means the execute action is realized by the one who signs; the instance 27 means the state action is realized by one hands-over. Thus, the DOCUMENTAL PROCESS STEP *class* implements the blood drawing consent transaction through these five steps, i.e. they are the realization of TRANSACTION KIND. We emphasize the ternary facts types between D-ACT KIND *class* and DOCUMENTAL PROCESS STEP *class*. This stems from the fact that we must know in which order each step took place at the documental process

level. The sentences predicate for ternary fact types was written in red, and it is represented by *[documental process step] realizes [d-act kind]*.

The blood drawing consent letter, as one can see in figure 4, is a type of consent letter. Consent letters are document types from DOCUMENT *class*. DOCUMENT *class* refers to the population of documents that are made and used according to needs and purposes of the organization. The documents in DOCUMENT *class* are a type of DOCUMENT KIND *class*. This class consists of documents types that can exist into an organization. As already mentioned above, we are dealing with documents - for example, blood drawing consent letter - that are created in order that people can register and thereby transfer rights and obligations between them. So, documents have an important function, named document act. In our scope of interest, the performer (patient) and addressee (nurse) comply with the commitment after the patient to signing the blood consent letter, in order to legally transfer to the nurse the right of drawing a patient´s portion of blood.

In our model (FIG. 4), the D-ACT *class* is the core of our approach. Indeed, it represents a document act. The D-ACT *class* specifies all particular acts of a particular transaction. It is represented by the binary fact type *[d-act] of [transaction kind],* whose instance level is *[d-act] of [blood drawing consent]*. In D-ACT *class* one also can find the history of a particular process. Furthermore, the D-ACT *class* represents the history of a particular document, represented by the binary fact type *[d-act] affects [document],* whose instance level f is *[d-act] affects [blood drawing consent letter]*. This means thatbefore a registration and a signature a document has no function. We use documents to record commitments, because documents enforce restrictions within social interactions.

We also have in *D-ACT class* all history of a transaction. In FIG.3, the Transaction T01 - *blood drawing consent realization*, and T02 - *blood drawing consent letter singing* are kinds of a particular transaction. Thus, in D-ACT *class* we have all particulars acts needed for register the blood drawing consent. Such as consent authorizes the healthcare professional for (legally) blood drawing from a patient that declares her social intention. Thus, in D-ACT *class*, one can see: i) the fact type that has been registered in the blood drawing consent by the patient; ii) when this patient signed the consent letter; iii) the document that has been used; iv) who generated the consent letter; v) when the patient filled and signed the blood drawing consent letter and, vi) the professional that received this blood drawing consent letter; to mention a few. This means that the effects of a declaration can be extended and through documents with legal value. However, this happens only when the patient fills and signs the blood drawing consent letter. Only from the patient's signature the procedure can be carried out. Thus, we also can say that acts at D-ACT *class* carry a proposition of declaration formalized in specific document.

Finally, the D-ACT *class* specifies all particular acts of a particular transaction., This occurs because, for each D-ACT *class* instance, it should be identified : i) the result of a transaction – declaration type (blood drawing consent); ii) the document required for this declaration (blood drawing consent letter); iii) all actions (D-ACT KIND), which must be realized at datalogical abstraction level (DOCUMENTARY PROCESS STEP), to register (to sign) the declaration and; iv) the coordination or production act used in each action (D-ACT KIND).

5. Discussion and final remarks

We presented approach towards a social entity dimension to characterize document acts in DEMO Method. However, we intend to conduct our investigation in order that many kinds of document acts also can be encompassed. To achieve the results, we have presented a brief theoretical account of theories of DEMO Method, Document act Theory and d-act ontology. Then, we introduced a theory to deal with acts raised by the power of documents. In practical aspects, we have developed a model to reach the claimed complementary characterization between theories.

We use some theoretical foundations underlying the document act theory and the d-act ontology to develop our model in DEMO Method. This approach has shown us to be fruitful, because, on one hand, we can bring to DEMO Method a new perspective of documents; on the other hand, the construction of our model using our own method has showed clearly that documents acts indeed register facts that arise from social acts.

Finally, our model was employed in a real case, so that we could explain the whole process involved to register commitments in documents. We showed the steps at documental process level, which were necessary to ensure that consents could be finally registered in the document and thus meet the requirements. We also showed how each act at documental level was created and recorded until the document was delivered to the addressee.

We argue that facts embodied in documents are records of social acts including their rights and obligations required to fulfill commitments for the creation of any product or service. Document registers the creation of new social artifacts, assigning responsibilities to those who produce it, signs it, and so forth. Thus, only documents are able to extend these commitments to the long term

The next step in our research is to apply our model in other circumstances for different types of declarations. Moreover, we intend to investigate how to analyze and identify the documents that area relevant to the organizational domain. We also intend to create an ontological model in order to keep the entire document lifecycle, since its creation up to its discard, in order we can reach a full model to represent document acts using our approach.

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