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Subject: Preparatory document for the kick-off meeting of the Task Force Terminology Server – The epSOS MVC / MTC, and the eCRTS (epSOS Central Reference Terminology Server)

I thought it would be interesting to try to bring together all the information about the epSOS MVC, the MTC and the terminology services that are dispersed in different documents and deliverables from the project.

1. epSOS Master Value Sets Catalogue (MVC) and Master Translation/Transcoding Catalogue (MTC)

In epSOS, two work packages -WP 3.1 and 3.2- identified all the data elements that would constitute the documents exchanged between the participating nations, i.e. the ePrescription, eDispensation, and Patient Summary documents. Many of those elements, either in the header or in the body could be coded and it was subsequently the task of WP 3.5 to identify the various code systems to be used and the value sets from them; this led eventually to the establishment of the epSOS MVC (epSOS Master Value Sets Catalogue).

To make the epSOS MVC manageable, WP 3.5 selected a number of concepts instead of the full content of the selected code systems (SNOMED CT, ICD-9 and ICD-10, LOINC, ATC, HL7, etc.); the most commonly used terms within the particular context were chosen. Using this approach, for each coded element in the CDA document a set of values from only one code system was assigned, composing the corresponding Value Set. The idea behind this approach was that, since transcoding or translation would be necessary at MS level later; the number of terms in the value sets should be limited, while at the same time, providing the largest medical coverage possible.

Then, the epSOS MVC was at national level the basis for the epSOS MTC (epSOS Master Translation/Transcoding Catalogue). The MTC cross-referenced (“mapped”) the English term with the target language display and any necessary ‘transcoding’ to any national code system.

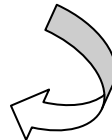
An example of the translation of MVC display terms in English to Finnish is shown below for the ATC classification:

1	Parent Code System:	Anatomical Therapeutic Chemical
2	OID Parent Code System:	2.16.840.1.113883.6.73
3	epSOS Value Set Name:	epSOSActiveIngredient
4	epSOS OID:	1.3.6.1.4.1.12559.11.10.1.3.1.42.24
5	website:	N/A
6	version:	January 2010
7	Translation:	TO BE TRANSLATED
8	Skill needed:	N/A
9		
10	The Value Set is used as a mandatory code for the Active Ingredient of medications in the Medications Summary as well as the prescription Sections. Also used to code allergy agents in the Allergies and Other Adverse Reactions Section of the patient Summary.	
11		
12	Total terms:	5592
13		
14	#	epSOS Code
15		English Display Name
16	1	A
17	2	A01
18	3	A01A
19	4	A01AA
20	5	A01AA01
21	6	A01AA02
22	7	A01AA03
23	8	A01AA04
24	9	A01AA30
25	10	A01AA51
26	11	A01AB
27	12	A01AB02
28	13	A01AB03
29	14	A01AB04
30	15	A01AB05
31	16	A01AB06
32	17	A01AB07
33	18	A01AB08
34	19	A01AB09
35	20	A01AB10
36	21	A01AB11
37	22	A01AB12
38	23	A01AB13
39	24	A01AB14
40	25	A01AB15
41	26	A01AB16
	27	A01AB17

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Code Translation
A RUUANSULATUSELINTEN SAIRAUKSIEN JA
AINEENVAIHUNTASAIRAUKSIEN LÄÄKKEET
A01 SUUN JA HAMPaidEN HOIToon TARKOITETUT VALMISTEET
A01A SUUN JA HAMPaidEN HOIToon TARKOITETUT VALMISTEET
A01AA Hammasmääntä ehkäisevät lääkkeaineet
A01AA01 Natriumfluoridi
A01AA02 Natriummonofluorofosfaatti
A01AA03 Olafluuri
A01AA04 Tinafluoridi
A01AA30 Yhdistelmävalmisteet
A01AA51 Natriumfluoridi, yhdistelmävalmisteet
A01AB Suun paikallishoitoon tarkoitettut mikrobilääkkeet
A01AB02 Vetyperoksidi
A01AB03 Klooriheksidiini
A01AB04 Amfoterisiini
A01AB05 Polynoksyliini
A01AB06 Domifeeni
A01AB07 Oksikinoliini
A01AB08 Neomysiini
A01AB09 Mikonatsoli
A01AB10 Natamysiini
A01AB11 Muut
A01AB12 Heksetidiini
A01AB13 Tetrasykliini
A01AB14 Bentsoksoniumkloridi
A01AB15 Tibtetsoniumjodidi
A01AB16 Mepartrisiini
A01AB17 Metronidatsoli

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Value set for the active ingredient data element (ATC classification) in the MVC and translation of the display terms into Finnish

2. The epSOS Central Reference Terminology Server (eCRTS)

As stated in epSOS documentation, the MVC and MTC were developed, validated, archived and downloaded to the NCP in every MS using the **epSOS Central Reference Terminology Server (eCRTS)**¹ based on HealthTerm, the proprietary terminology server developed by CareCom (Danish software company member of the epSOS Industry team).

As I understand the process, first, the Semantic Experts created the epSOS MVC in a simple Excel file where each sheet represented a Value Set. Each Value Set had a name, an OID, a column listing the codes and an adjacent column containing the display names for the codes in English. The content of the Value Sets could represent the entire coding system or, in most cases, just part of it. The image below shows part of the Value Set “epSOSActiveIngredient”:

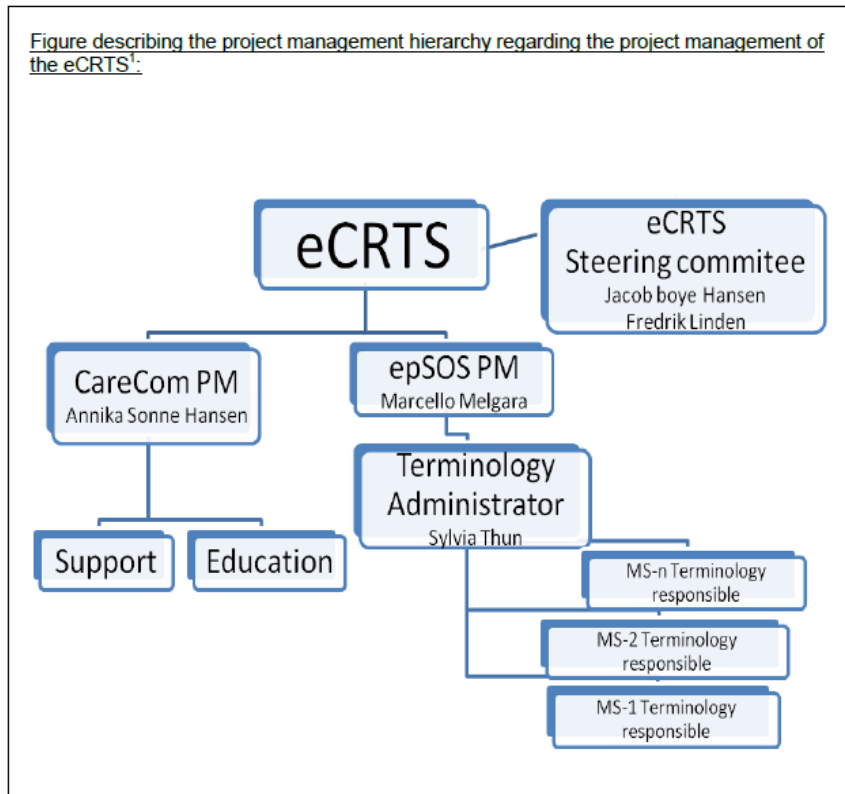
1	Parent Code System:	Anatomical Therapeutic Chemical	
2	OID Parent Code System:	2.16.840.1.113883.6.73	
3	epSOS Value Set Name:	epSOSActiveIngredient	
4	epSOS OID:	1.3.6.1.4.1.12559.11.10.1.3.1.42.24	
5	website:	N/A	
6	version:	January 2010	
7	Translation:	TO BE TRANSLATED	
8	Skill needed:	N/A	
9			
10	The Value Set is used as a mandatory code for the Active Ingredient of medications in the Medications Summary as well as the prescription Sections. Also used to code allergy agents in the Allergies and Other Adverse Reactions Section of the patient Summary.		
11			
12	Total terms:		5592
13			
14	#	epSOS Code	English Display Name
15		1 A	ALIMENTARY TRACT AND METABOLISM
16		2 A01	STOMATOLOGICAL PREPARATIONS
17		3 A01A	STOMATOLOGICAL PREPARATIONS
18		4 A01AA	Caries prophylactic agents
19		5 A01AA01	sodium fluoride
20		6 A01AA02	sodium monofluorophosphate
21		7 A01AA03	olafur
22		8 A01AA04	stannous fluoride
23		9 A01AA30	combinations
24		10 A01AA51	sodium fluoride, combinations
25		11 A01AB	Antiinfectives and antiseptics for local oral treatment

The import of national translations, classifications, and/or mappings into the eCRTS was done at the beginning of the project directly by CareCom staff upon receiving the .tsv files from MS. I believe that subsequent translations and/or mappings were performed then directly by the terminology experts of each MS.

In the Appendix B.3¹ to the Deliverable D.3.9.1, it is explained the organizational structure for the project management of the terminology services. At MS level, 2 roles – MS Terminology responsible and MS HealthTerm System Administrator- performed crucial tasks creating terminology content and technical support and communication (see image below):

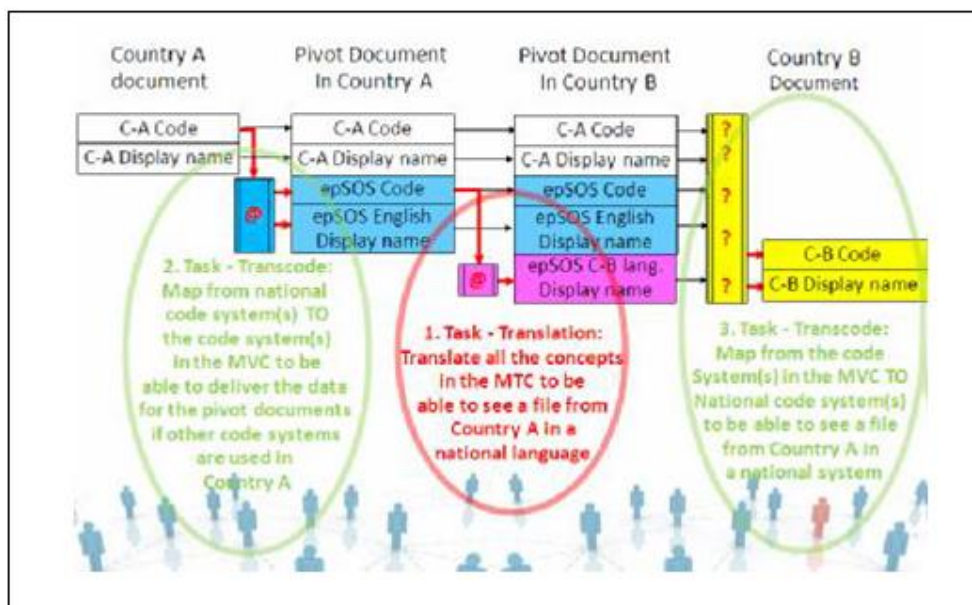
¹ WP 3.9 – D3.9.1 – Appendix B.3 epSOS Central Reference Terminology Server (eCRTS). Last accessed on 19/01/2016: http://www.epsos.eu/uploads/tx_epsosfileshare/D3.9.1_Appendix_B3_eCRTS_v1.1.1_20110725.pdf

Figure describing the project management hierarchy regarding the project management of the eCRTS¹:



My impression is that MS used the eCRTS mostly to perform translations/transcoding or mappings once an initial upload was done by CareCom. In fact, and according to epSOS Deliverable D3.9.1, to help with the translation work, the complete content of the code systems was available at the eCRTS to allow a high quality translation by facilitating translators the complete context of the concepts.

This same deliverable lists the different tasks to be performed by MS to be able to exchange structure data -only one was mandatory (see figure below from D3.9.1):



1. Translation of the MVC (mandatory)

Each MS completed a translation of all the concepts in the MVC to allow the display of terms in the MS national language. For this purpose, Ms could use the functionalities of the eCRTS to access the MVC Value Sets and the translation module.

2. Transcode from national code system to the MVC (semi-optional)

If a MS was applying other code systems than those selected to represent concepts in the epSOS MVC Value Sets, this MS had to transcode/map from the national code system to the code system in the MVC to manage the exchange of data required in the CDA documents.

MS could use the functionalities of the eCRTS and the existing MVC Value Sets to prepare the transcoding/mapping.

3. Transcode from the code systems in the MVC to national code systems (optional)

If a MS preferred to show the data from country A in its own national code system which was different to the one selected for the MVC, this MS must transcode/map from the code system in the MVC to its code system.

The eCRTS provided the necessary functionality for the transcoding/mapping.

D3.9.1 continues explaining that the terminology server offered a translation workflow; translations could be given a status of 'translation finished and Quality Assured' or they can be processed into a certain stage of the workflow for further QA. Using the translation module, translations were saved with an ID which contained the epSOS MS namespace identifier to secure traceability.

For transcoding/mapping, the national code system should have been imported previously in the eCRTS. Once the code system was imported, MS could proceed using the mapping module, assigning roles to the users in the different stages of the mapping workflow.

I have included as an annex the description of the eCRTS components described in the deliverable (see [here](#)).

3. epSOS criteria for the selection of the terminology server and final comments

The decision to use HealthTerm in epSOS is explained in one document from the EXPAND project² where two additional criteria proposed by the Semantic Maintenance Workshop are listed:

“The software selection for the epSOS Central Reference Terminology Server (eCRTS) was done in 2009 based on epSOS D3.5 Appendix F concepts. The decision was achieved through a thorough set of presentations to the epSOS Board of MS Ministries. CareCom was the only

² EXPAND D5.1 – Scope and transferability of key outcomes of epSOS and corresponding actions for transferability and scale up. Last accessed 07/09/2015: <http://www.expandproject.eu/wp-content/uploads/2015/02/EXPAND-D5.1-Scope-and-transferability-of-key-outcomes-of-epSOS.pdf>

vendor fulfilling the ten requirements agreed upon (a-j in the list below). The assessment was subsequently repeated twice in epSOS, but not alternative solution was found at that time.

The basic criteria applied for solution selection, also included in EXPAND D1.4 Appendix, were:

- a. Be compliant to D3.5.2 Appendix F requirements, in particular:
- b. Allow the management of Code system versioning, creating value sets within a code system, to create the Master value Set Catalogue (MVC)
- c. Allow the management of multilingual designations to create the Master Translation Transcoding Catalogue (MTC)
- d. Allow the management of mapping between code systems (for MTC)
- e. Provide a robust process to define, curate, verify, approve, publish code systems, their translation and mapping, through a controlled workflow, with flexible assignment of roles to users
- f. Provide a web user interface to perform the above tasks
- g. Provide the way to download: code systems, translations and mapping between code systems
- h. Provide the way to download the full, part of the MVC/MTC in a human readable format (MS Excel)
- i. Provide an online service to full and incremental download the MVC/MTC
- j. Provide a consulting and training support to Member States

EXPAND Semantic Maintenance Shop will request in addition:

- k. The interfaces should be compliant to the sub-set of the HL7 CTS2 specifications, identified in epSOS and revised in EXPAND
- l. The system should be declared Open Source according to accepted license models (EUPL, ASL V2, GPL V3)".

Finally, I shall mention some points highlighted as outcomes in EXPAND^{2,3} that refer to the MVC and the eCRTS – in addition to the need for selecting a new terminology server:

- **Catalogue maintenance and Value Sets coordination at EU level.** During EXPAND discussions, the participants acknowledged that, although there is a need for commonly agreed value-sets, these not represent the solution for all the patient cross-border data exchange requirements. A global terminology strategy as well as the necessary mapping was mentioned as key.
- **Need for central governance and coordination of the production, maintenance and location of the Value Sets.**
- **Revision of the current epSOS reference terminology.**

³ EU level eHealth DSI – Semantic coordination proposal. Discussion paper (v.2.0). Last accessed 19/01/2016: http://ec.europa.eu/health/ehealth/docs/ev_20150512_co35_en.pdf

ANNEX

eCRTS architecture and interfaces (from D3.9.1 epSOS Pilot System Components Specifications)

The eCRTS is a web based application made up of several modules:

– User administration

At three levels: namespace administration, usergroup administration, and user administration.

- Namespace: each MS was given a seven digit epSOS namespace identifier to which MS national code systems were linked. Likewise, when a MS created value sets, translations, or transcodings, the namespace identifier was contained in the identifier of the components.

Namespace identifiers were also use for user's rights control.

- User groups: an epSOS Terminology Administrator was given the rights to create new users and user groups, and selected the privileges relevant for the groups: namespace rights (browsing, editing, upload, requestor, distributor, and value set access rights); system access rights (user administrator rights, organizing rights, etc.); content rights-roles (translator, reviewer, mapper, etc.).
- User administration: individual rights were inherited by assigning users to one or more user groups. At individual level, users could set different filters for searches and set the language to be displayed in the eCRTS user interface.

– Browsing

This module allowed browsing the code system an eCRTS user had grating access right to. According to the document stating the specifications of the eCRTS, the browser window should allow users to see the hierarchical structure of the classification as a tree structure, should also allow the user to select a concept and display its characteristics. More specifically, the detail view of a concept should contain information about: any parents and children, fully specified name, concept ID/codes, preferred term, synonyms; relationships; etc.

– Value set creation and maintenance

Its functionalities would include: displaying the hierarchy of created value sets; selecting a value set and displaying its IDs, version, language, and status; if given the appropriate rights, creating new value sets, adding members from queries by selecting concepts, subhierarchies, other subsets (either by adding or subtracting portions of concepts or by selecting the intersection between two sets); add members importing external files; replace inactive members.

– Translation

This module handled a dynamic construction of workflows. A translation workflow should comprise a number of stages that a concept translation went through: at a minimum, Translation (external or internal), Review 1 (external), Review 2 (internal), SME (Subject Matter Expert, internal), Editorial Board (internal).

– Transcoding/ mapping

This module allowed users to:

- Create mapsets as folders for each transcoding/ mapping project.
- Create and select textual rules sets used in the individual transcoding/ mappings.
- Create and select category set for helping the user link contextual categories to concepts which are declared unmappable.
- Select how big an amount of concepts should be in a transcoding/mapping project and grant the rights for the roles in the mapping workflow.
- Provide mappers and reviewers with: search, browsing functionalities while doing the transcoding/mapping; help finding the equivalent match for a transcoding/mapping in automatically finding semantically equivalent/similar concepts in the other code system; information of the progress in the mapping workflow.

– Export/ distribution

This module allowed the export of published data in the eCRTS to a secure ftp site; although it was supposed that the majority of the transfers from the eCRTS to MS would be performed using web services in the common component.