

SimpleClinicalDocument

A (Java) toolbox for generating DK PHMR

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Motivation

Documents are documents

- “... Once everything is said, software is defined by code.” [Bertrand Meyer]
- You have to read, understand, and *interpret* the profile to make your software.
 - Sources of errors: misreading, misunderstanding, misinterpreting, and of course *errors in the profile*

One solution: **Reference implementation**

- ... *the standard from which all other implementations, with their attendant customizations, are measured, and to which all improvements are added* [Wikipedia]
- **Symbiotic relation with the specification itself**
 - Finds defects, spots inconsistencies and ambiguity



Learning Curves

HL7, CDA, and PHMR are intrinsically difficult standards!

Breaking the learning curve

- Provide tutorials and documentation material
 - Major focus point in Net4Care
- Encapsulate/hide complexity
 - GreenCDA initiative
 - You define ‘dynamic fields’, we supply ‘static fields’



SimpleClinicalDocument (1)

The 'context' information

```
// 1. Create a PHMR document as a "Green CDA", that is,  
// a data structure containing only the dynamic data  
// of a CDA.  
SimpleClinicalDocument cda = new DanishPHMR();  
  
// 1.1 Populate with time and version info  
cda.setDocumentVersion("2358344", 1);  
cda.setEffectiveTime(documentCreationTime);  
  
// 1.2 Populate the document with patient information  
cda.setPatient(nancy);  
  
// 1.3 Populate with Author, Custodian, and Authenticator  
cda.setAuthor(svendborgHjerteMedicinskAfdeling, andersAndersen, documentCreationTime);  
cda.setCustodian(svendborgHjerteMedicinskAfdeling);  
Date at1000onJan13 = makeDateTime(2014, 0, 13, 10, 0, 0);  
cda.setAuthenticator(svendborgHjerteMedicinskAfdeling, andersAndersen, at1000onJan13);  
  
// 1.4 Define the service period  
from = makeDateTime(2014, 0, 6, 8, 2, 0);  
to = makeDateTime(2014, 0, 10, 8, 15, 0);  
cda.setDocumentationTimeInterval(from, to);
```



SimpleClinicalDocument (2)

The 'measurement' information

- Convenience methods for all standard telemedical m.

```
// 1.6 Add measurements (observations)

// Example 1: Use the helper methods to easily create measurements
// for commonly used telemedical measurements, here exemplified
// by weight. Note - no codes, displaynames, nor UCUM units are
// given.
Date at0802onJan6 = makeDateTime(2014, 0, 6, 8, 2, 0);
cda.addMeasurement(NPU.createWeight(77.5, at0802onJan6));

// Use the basic methods that allow any legal
// code system to be used but requires all data to be
// provided
Date at0745onJan8 = makeDateTime(2014, 0, 8, 7, 45, 0);
Measurement weight2 =
    new Measurement("NPU03804", "Legeme masse; Pt", 77.0, "kg", at0745onJan8);
cda.addMeasurement(weight2);
```

But allows arbitrary codes



Context Datatypes

Classes for all the details...

```
// Setup Nancy as patient
nancy =
    new PersonIdentity("2512484916",
        new String[]{"Nancy", "Ann"}, "Berggren", "F",
        "19481225",
        new AddressData(AddressUse.HomeAddress,
            new String[]{"Skovvejen 12", "Landet"}, "5700", "Svendborg",
            "Danmark" ),
        new Telecom[] {
            new Telecom(AddressUse.HomeAddress, "tel:65123456"),
            new Telecom(AddressUse.WorkPlace, "mailto:nab@udkantsdanmark.dk") }
    );

// Setup Svendborg sygehus Hjertemedicinsk B as organization
svendborgHjerteMedicinskAfdeling =
    new OrganizationIdentity("88878685",
        "Odense Universitetshospital - Svendborg Sygehus",
        new Telecom[]{new Telecom(AddressUse.WorkPlace, "tel:65112233")},
        new AddressData(AddressUse.WorkPlace,
            new String[]{"Hjertemedicinsk afdeling B", "Valdemarsgade 53"},
            "5700", "Svendborg", "Danmark" ) );

// Setup Anders Andersen as authenticator
andersAndersen =
    new PersonIdentity(new String[]{"Anders"}, "Andersen");
```



Tools for the developers

Construct your own 'builders'

```
SimpleClinicalDocument:
setId: 2358344 / version: 1
Patient: 2512484916: Nancy Berggren
Author:
  Odense Universitetshospital - Svendborg Sygehus
  - Anders Andersen
Custodian:
  Odense Universitetshospital - Svendborg Sygehus
Authenticator:
  Odense Universitetshospital - Svendborg Sygehus
  - Anders Andersen
Measurements:
  0: Mon Jan 06 08:02:00 CET 2014 :: Legeme masse; Pt 77.5 kg
  1: Wed Jan 08 07:45:00 CET 2014 :: Legeme masse; Pt 77.0 kg
Medical device: Manufacturer: AD Company / Model: 6121ABT1 SerialNr: 6121ABT1-987 Rev. 3 / SW Rev. 20144711
```

A plain text output

```
Validity is: false
-> The patient's first name is missing or empty
-> The author's family name is missing or empty
```

```
validator = new ValidatingBuilder();
cda.construct(validator);
String listOfErrors = validator.toString();
```

Pending work 😊

```
xdsMetaData = new XdsMetaDataBuilder();
cda.construct(xdsMetaData);
```



Vision

Open source Java module,

- open for contribs (bug fix, other languages, ...)

Website with tutorials and examples

Stay in sync with Danish Profile



Status

Only handles MedCom Ex1 at present

- Will handle all aspects ‘soon’...

In internal review

ToDo list

- XDS.b metadata builder
- A reader: Read DK PHMR → SimpleClinicalDocument
 - Including validation according to our DK profile...

