Proof-of-Concept scope and scenario's for sharing of labresults using HL7-CDA specification

Contents

Background

Currently, results of clinical biology tests are shared as plain, unstructured text, which mostly only allows these results to be shown one by one and hinders automated further treatment of these data, e.g. to view evolutions of parameters etc.

The eHealth-platform has developed a structured format based on HL7-CDA and IHE profiles.

A Proof-of-Concept is set-up to verify the correct implementation of the structured format at the various systems involved: labs for clinical biology, software for healthcare providers and hubs

Objective of this document

This document describes the scope and scenario's for the PoC

List of used abbreviations

Abbrev.	Full text
HCP	Health care provider
HL7	Health Level 7
CDA	Clinical Document Architecture

Document history

Version	Date	Author	Description
1.00	09/11/2017	E. Slabbinck	Initial version
1.01	13/03/2017	E. Slabbinck	Modifications following review

Participating systems

- HCP SW : Software for healthcare providers; this component typically receives the lab results
- Lab SW: Software of labs for clinical biology; this system typically is the source of the lab results
- Hub: hub from the system for sharing of medical data

General preconditions

1. At least 2 laboratories, Lab1 and Lab2 are connected via VPN to the hubs
2. HCP SW is connected to the hubs in sessions; all scenario's assume that the sessions have been established
3. Lab results can have different statuses, i.e. "executed", "verified", "validated"
4. Lab1 has at least 5 lab reports for a testpatient P1, in particular the following reports:
    a. unstructured lab report R1
    b. structured lab report R2 for 10 coded analyses chemistry; the scenarios use 3 versions of this report
    c. structured lab report R3 for multiple specimens, with mixture of LOINC and non-LOINC tests
    d. structured lab report R4 for bacteriological test with 3 germs; 2 of these incl. culture; the report contains an antibiogram
    e. structured lab report R5 for 10 coded analyses chemistry, results different from report R2; the scenarios use 3 versions of this report
5. Lab2 has at least 1 lab reports for a testpatient P1, in particular the following report:
    a. Structured lab report R6 for 10 coded analyses chemistry, with 4 of the analyses for the same tests as report R2

Scenario's

The following scenario's are used:

1. HCP requests a transaction list for patient P1 from the hub; the resulting list contains at least 5 lab reports
2. HCP retrieves version V1 of a structured lab report R2 from the hub
3. HCP retrieves version V2 of a structured lab report R2 from the hub, version V2 has some results that have been modified from version V1
4. HCP retrieves version V3 of a structured lab report R2 from the hub, version V3 has additional tests compared to previous versions
5. HCP retrieves version V1 of a structured lab report R3 from the hub
6. HCP retrieves version V1 of a structured lab report R4 from the hub
7. Lab SW sends version V1 of a structured lab report R5 via eHealthBox to the HCP SW
8. Lab SW sends version V2 of a structured lab report R5 via eHealthBox to the HCP SW, version V2 has some results that have been modified from version V1
9. Lab SW sends version V3 of a structured lab report R5 via eHealthBox to the HCP SW, version V3 has additional tests compared to previous versions
10. HCP retrieves version V1 of structured lab report R6 from the hub

Scenario 1: HCP requests transaction list for patient P1 from the hub

Preconditions

1. The HCP SW must store the test reports and the statuses of these reports

Functional test scenario

This test scenario focuses on the sharing of lab results and does not take into account that other documents may be available for this patient. For the case of simplicity, these other documents are neglected.

S1		
Step	**Action**	**Success / Fail criterium**
1	HCP SW sends GetTransactionList request to hub for patient P1, requesting all known transactions	
2	Hub send a GetTransactionList request to the lab SW for patient P1, requesting all known transactions	
3	Lab SW returns a list of all known transactions for patient P1 to the hub	At least the entries for the 5 lab reports described in the general preconditions are available
4	Hub returns a list of transactions for patient P1 to the HCP SW	
5	The HCP SW displays the list of transactions for patient P1	The HCP SW displays the list of available results; The HCP SW may provide the possibility to apply a filter so that only lab results are shown

Scenario 2: HCP retrieves version V1 of a structured lab report R2 from the hub

Preconditions

1. HCP SW has previously executed a GetTransactionList request for patient P1, the resulting list contains at least a structured report R2
2. The version of the lab report R2 is V1
3. All the test-results have status "initially available"

Functional test scenario

S2		
Step	**Action**	**Success / Fail criterium**
1	HCP SW sends GetTransaction request to the hub for labresult R2, using the document ID that was previously obtained	
2	Hub SW forwards the GetTransaction request to lab SW	
3	Lab SW returns the structured lab report R2 to the hub; the version number of the result is 1	
4	The hub forwards the structured lab report R2 to the HCP SW	
5	The HCP SW receives the lab report R2	
6	The HCP SW displays the lab report R2	The report is shown correctly
7	The HCP SW stores version 1 of lab report R2 in the EMR of the patient	

Steps 6 and 7 may be swapped depending on the implementation of the HCP SW; this remark is also valid for the subsequent scenarios.

Scenario 3: HCP retrieves version V2 of a structured lab report R2 from the hub

Preconditions

1. HCP SW has previously stored version 1 of lab report R2 for patient P1
2. HCP SW has executed a GetTransactionList request for patient P1, the resulting list contains at least a structured report R2
3. The version of the lab report R2 is V2
4. A number of test reports have status "verified" or "validated"

Functional test scenario

S3		
Step	**Action**	**Success / Fail criterium**
1	HCP SW sends GetTransaction request to the hub for labresult R2, using the document ID that was previously obtained	

S3		
Step	**Action**	**Success / Fail criterium**
2	Hub SW forwards the GetTransaction request to lab SW	
3	Lab SW returns the structured lab report R2 to the hub; the version number of the result is 2	
4	The hub forwards the structured lab report R2 to the HCP SW	
5	The HCP SW receives the lab report R2	
6	The HCP SW displays the lab report R2	The latest version of the report is shown correctly. If previous versions of the lab report R2 are available in the EMR, the HCP SW may provide the possibility to switch between the different versions and may highlight the differences between the reports.
7	The HCP SW stores version 2 of lab report R2 in the EMR of the patient	The HCP SW recognizes that the newly imported report is a subsequent version of a previous report and either overwrites the previous version or stores the versions besides the previous version; the newly imported version is signaled as the most up-to--date version of the report

Scenario 4: HCP retrieves version V3 of a structured lab report R2 from the hub; version V3 contains additional tests compared to previous versions

Preconditions

1. HCP SW has previously stored version 2 and possibly also version 1 of lab report R2 for patient P1
2. HCP SW has executed a GetTransactionList request for patient P1, the resulting list contains at least a structured report R2
3. The version of the lab report R2 is V3, which contains the reports of additional tests compare to previous versions of R2

S4		
Step	**Action**	**Success / Fail criterium**
1	HCP SW sends GetTransaction request to the hub for labresult R2, using the document ID that was previously obtained	
2	Hub SW forwards the GetTransaction request to lab SW	
3	Lab SW returns the structured lab report R2 to the hub; the version number of the result is 3	
4	The hub forwards the structured lab report R2 to the HCP SW	
5	The HCP SW receives the lab report R2	
6	The HCP SW displays the lab report R2	The latest version of the report is shown correctly. If previous versions of the lab report R2 are available in the EMR, the HCP SW may provide the possibility to switch between the different versions and may highlight the differences between the reports.
7	The HCP SW stores version 3 of lab report R2 in the EMR of the patient	The HCP SW recognizes that the newly imported report is a subsequent version of a previous report and either overwrites the previous version or stores the versions besides the previous version; the newly imported version is signaled as the most up-to--date version of the report

Scenario 5: HCP retrieves version V1 of a structured lab report R3 from the hub

Preconditions

1. HCP SW has executed a GetTransactionList request for patient P1, the resulting list contains at least a structured report R3
2. The version of the lab report R3 is V1
3. All the test-results have status "initially available"

S5		
Step	**Action**	**Success / Fail criterium**
1	HCP SW sends GetTransaction request to the hub for labresult R3, using the document ID that was previously obtained	
2	Hub SW forwards the GetTransaction request to lab SW	
3	Lab SW returns the structured lab report R3 to the hub; the version number of the result is V1	
4	The hub forwards the structured lab report R3 to the HCP SW	
5	The HCP SW receives the lab report R3	
6	The HCP SW displays the lab report R3	The report is shown correctly. The results that are not using LOINC-codes are shown using the other available information.
7	The HCP SW stores version V1 of lab report R3 in the EMR of the patient	

Scenario 6: HCP retrieves version V1 of a structured lab report R4 from the hub

Preconditions

1. HCP SW has executed a GetTransactionList request for patient P1, the resulting list contains at least a structured report R4
2. The version of the lab report R4 is V1
3. All the test-results have status "initially available"

Functional test scenario

S6		
Step	**Action**	**Success / Fail criterium**
1	HCP SW sends GetTransaction request to the hub for labresult R4, using the document ID that was previously obtained	
2	Hub SW forwards the GetTransaction request to lab SW	

S6		
Step	**Action**	**Success / Fail criterium**
3	Lab SW returns the structured lab report R4 to the hub; the version number of the result is V1	
4	The hub forwards the structured lab report R4 to the HCP SW	
5	The HCP SW receives the lab report R4	
6	The HCP SW displays the lab report R4	The report is shown correctly.
7	The HCP SW stores version V1 of lab report R3 in the EMR of the patient	

Scenario 7: Lab SW sends version V1 of a structured lab report R5 to HCP SW

Preconditions

1. Lab SW has knowledge that HCP SW accepts structured lab reports
2. The version of the lab report R5 is V1
3. All the test-reports have status "initially available"

Functional test scenario

S7		
Step	**Action**	**Success / Fail criterium**
1	Lab SW sends verson 1 of labreport R5 to the HCP SW via the eHealthBox	
2	The HCP SW receives the labreport R5	
3	The HCP SW displays the labreport R5	The report is shown correctly.
4	The HCP SW stores version 1 of lab report R5 in the EMR of the patient	

Scenario 8: Lab SW sends version V2 of a structured lab report R3 to HCP SW

Preconditions

1. Lab SW has knowledge that HCP SW accepts structured lab reports
2. The version of the lab report R5 is V2
3. A number of test reports have status "verified" or "validated"
4. Version V1 of the structured report R5 is present in the HCP SW

S8		
Step	**Action**	**Success / Fail criterium**
1	Lab SW sends verson 2 of labreport R5 to the HCP SW via the eHealthBox	
2	The HCP SW receives the labreport R5	
3	The HCP SW displays the labreport R5	The latest version of the report is shown correctly. If previous versions of the lab report R5 are available in the EMR, the HCP SW may provide the possibility to switch between the different versions and may highlight the differences between the reports.
4	The HCP SW stores version 2 of lab report R5 in the EMR of the patient	The HCP SW recognizes that the newly imported report is a subsequent version of a previous report and either overwrites the previous version or stores the versions besides the previous version; the newly imported version is signaled as the most up-to--date version of the report

Scenario 9: Lab SW sends version V3 of a structured lab report R5 to HCP SW, version V3 contains additional tests compared to previous versions

Preconditions

1. Lab SW has knowledge that HCP SW accepts structured lab reports
2. The version of the lab report R5 is V3, which contains the reports of additional tests compare to previous versions of R5
3. At least version V2 and possibly also version V1 of the structured report R5 are present in the HCP SW

Functional test scenario

S9		
Step	**Action**	**Success / Fail criterium**
1	Lab SW sends verson 3 of labreport R5 to the HCP SW via the eHealthBox	
2	The HCP SW receives the labreport R5	

S9		
Step	**Action**	**Success / Fail criterium**
3	The HCP SW displays the labreport R5	The latest version of the report is shown correctly. If previous versions of the lab report R5 are available in the EMR, the HCP SW may provide the possibility to switch between the different versions and may highlight the differences between the reports.
4	The HCP SW stores version 3 of lab report R5 in the EMR of the patient	The HCP SW recognizes that the newly imported report is a subsequent version of a previous report and either overwrites the previous version or stores the versions besides the previous version; the newly imported version is signaled as the most up-to--date version of the report

Scenario 10: HCP retrieves version V1 of structured lab report R6 from the hub

Preconditions

1. HCP SW has previously executed a GetTransactionList request for patient P1, the resulting list contains at least a structured report R6
2. The version of the lab report R6 is V1
3. All the test-results have status "initially available"

Functional test scenario

S9		
Step	**Action**	**Success / Fail criterium**
1	HCP SW sends GetTransaction request to the hub for labresult R6, using the document ID that was previously obtained	
2	Hub SW forwards the GetTransaction request to lab SW	
3	Lab SW returns the structured lab report R6 to the hub; the version number of the result is 1	
4	The hub forwards the structured lab report R6 to the HCP SW	

S9		
Step	**Action**	**Success / Fail criterium**
5	The HCP SW receives the lab report R6	
6	The HCP SW displays the lab report R6	The report is shown correctly
7	The HCP SW stores version 1 of lab report R6 in the EMR of the patient	
8	If the HCP SW provides the functionality to display various results for the same test, i.e. for identical LOINC/Albert codes, either in a table or in a graph, then all results must be shown in the same units	The results from report R2 and R6 are shown chronologically and using the same units