

eSanté LABO

eSanté-LABO_WP1-4

Interoperability matrix

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Customer

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Project	eSanté-LABO	
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1. Goal of the document

The goal of the document is to provide a state of practice (baseline) for laboratory information systems (LIS) in Luxembourg. Through the use of a questionnaire, this document will:

- Identify the data types currently available for patient identification, lab reports and associated metadata.
- Identify standard requirements for the information transfer process inside hospitals and non-hospital laboratories, in order to assess their ability to interact with the future eSanté platform.

The results of this survey will provide us with the current state of LIS in Luxembourg. The eSanté Team will compare these results with the technical specifications (data set and standards) of the future eSanté platform (Gap analysis). The ultimate goal is to gain an overview on the workload that each laboratory would have to commit to in order to interact with the future eSanté platform.

2. Introduction

The eSanté platform is the technical, software and organizational infrastructure, which will be put in place by the Luxemburgish government in order to support the secure exchange and sharing of health data in Luxembourg.

In the particular context of the eSanté-LABO project, it is planned that the eSanté platform will have functionalities to exchange and share information for lab reports and their associated metadata.

The two first services of the platform are:

- Sharing of health data
- Exchanging of health data

The eSanté Team organized interviews with LIS Providers, hospital and non-hospital labs. The attendees answered a questionnaire in order to identify key elements linked to their implementation of their LIS that could have an impact on the definition of the eSanté platform.

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3. Synthesis of LIS used in hospitals

The table below provides an overview of the ten LIS currently used in Luxembourg. Glims has been implemented in four labs, this is the main solution used in Luxembourg. Other LIS are each time only implemented in one lab. The LNS has two LIS, HomeMed and GLIMS, some departments using HomeMed are planned to change for GLIMS. The CHdN and les Forges du Sud have developed their own systems.

Lab	LIS	Company	Current version
CHDN - Centre Hospitalier du Nord		Custom specific implementation	1.8
CHEM - Centre Hospitalier Emile Mayrsh	OPUS::L	OSM (Agfa)	
		www.imp-ag.de/produkte/opus/index.html www.osm-gmbh.de/opus/opus.htm	
CHL - Centre Hospitalier du Luxembourg	GLIMS	MIPS www.mips.be	8
CRL - Croix Rouge Luxembourgoise	MAGIC	MAGIC SOFTWARE ENTERPRISESS LTD www.magicsoftware.com	9.4
FFE - Fondation François Elisabeth	JADE	GNT www.gnt.ch	3
FS - Les Forges du sud		Custom specific implementation	
KT - Ketterthill	GLIMS	MIPS www.mips.be	8.5.8
LNS - Laboratoire Nationale de Santé	GLIMS for	MIPS	8.5.3
	<ul style="list-style-type: none"> • Biochimie • Serologie • Hématologie 		
	HomeMed for		
	<ul style="list-style-type: none"> • Bacterio • SUBI (Surveillance biologique et environnementale) (planned to move to GLIMS) • Toxicologie (planned to move to GLIMS) 		
LR - Laboratoires Réunis	GLIMS	MIPS www.mips.be	
ZK - Zitha klinik	LAB400/CorLab	CORTEX / CEGEKA	3.6
		http://website.cegeka.be/en/markets/healthcare/pages/cortex.aspx	

4. Interoperability matrix

This document examines the current situation of the laboratories in Luxembourg regarding the interoperability. The information has been collected with the "Questionnaire for laboratories" and the "Questionnaire for LIS provider" eSanté-LABO WP1-2. The questions of the questionnaire have been listed at the end of this report.

The questionnaire for LIS provider studied seven main functional capacities of LIS:

- Architecture & Environment
- Patient ID
- Lab report
- Metadata
- User authentication
- Electronic signature
- Other questions

The 7 LIS providers concerned are:

- MIPS
- CEGEKA
- FS - Les Forges du Sud
- CHdN - Centre Hospitalier du Nord
- OSM
- MAGIC (No answer)
- GNT (No answer)

The questionnaire for the lab determine how the lab configure their LIS for this three domains:

- Patient ID
- Lab report
- Metadata

The 10 laboratories concerned are:

- CHEM - Centre Hospitalier Emile Mayrish
- CHL - Centre Hospitalier du Luxembourg
- FFE - Fondation François Elisabeth
- ZK - Zitha klinik
- CHDN - Centre Hospitalier du Nord
- LNS - Laboratoire Nationale de Santé
- CRL - Croix Rouge Luxembourgeoise
- KT - Ketterthill
- LR - Laboratoires Réunis
- FS - Les Forges du sud

The interoperability matrix is a set of synthesis of the questions analysed in next sections. The questionnaire for LIS provider has been used as the mainstream to structure the table, these questions are represented in orange. Questions for the labs represented in blue have been inserted at the end of each section. When the questionnaire treats the same topic; one to determine the functional capacity of the LIS and the second to determine how this capacity has been configured by labs, both questions have been placed together. The first column provides the number of the requirement, this is a reference to retrieve easily the corresponding detailed answer in the next section. Requirements are listed without ordering importance.

The interoperability matrix collects the general requirements handled by each or group of question and delivers the individual situation of lab regarding some criteria described in the last column "Legend". Answers of the LIS providers have been attributed to their respective labs.

4.1 Architecture

This sections aims to describe the general context of the LIS proposed, its integration with other system, its communication protocol and the IHE integration profile supported.

The examination of the answers shows:

- Heterogeneous environment with 7 different implementations.
- The main IHE profiles have been duty implemented only by GLIMS, other systems don't support IHE profiles explicitly. Nevertheless, the implemented IHE profiles deal only with the internal workflow of the lab. The implementation of the IHE XD-LAB profile, for the external communication of lab report, is foreseen for the end of 2012 for GLIMS and CEGEKA only if France or Austria select this profile nationally.
- Most of the different software implementations support HL7 V2.x, it seems that this could be the base communication protocol, although the customer specific LIS implementations have to be extended.
- As the LIS systems are not able to communicate directly using the Web-Service interfaces, it seems that the architectural integration between the LIS system and the eSanté platform should be based on a gateway/connector service. One side communicates with the LIS systems using HL7 v2.x and on the other side using Web-Service communication for the platform transactions.

Note:

XD-LAB - Sharing Laboratory Reports describes the content (human and machine readable) of an electronic clinical laboratory report.

Requirements		CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	Legend
1	Integration of the LIS with another IS	✓	✓	✓	✓	!	✗	✗	✓	✓	✓	X - Standalone ! - Module of a HIS V - Integrated
2	List of standard supported	✓	✓	✓	✓	✓	✗	✗	✓		✓	X - Other standards ! - V - HL7 v2.x based
3	List of IHE profiles supported	✓	✓	✓	✓	✗	✗	✗	✗		!	X - No IHE profile supported ! - Implemented without integration statement V - Implemented with integration statement
4	List of IHE profiles planned to be implemented	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗	X - No plan ! - V - Plan to implement additional IHE profiles

4.2 Patient ID

The eSanté platform must be able to associate the report sent to the platform to the concerned patient. There are several important requirements, which have to be fulfilled for unique patient identification in order to be able to federate patient data from different sources:

- Unique identifier for the institution
- Unique identifier for the patient in the institution (UPID)
- Demographic data of the patient

The examination of the answers shows:

- Sharing/Providing of patient demographics data will be needed for de-identification (pseudonymization) process, therefore the exchange of patient demographic data should be possible, e.g. using HL7 messages. Although most of the labs are not able to communicate using IHE PAM/PDQ, they are able to transmit identifying data using HL7 v2.
- Unique patient identification is an essential issue when sharing medical documents. All of the systems will be able to use internal unique patient identifiers for sharing documents with the platform. This information associated with a patient ID dataset will be needed to provide a unique patient identification inside the eSanté platform.
- Nearly all systems have the capability to distinguish between real patient- and test or non-human-being data. This is important since it must strictly be avoided to transfer non patient related data to the platform.
- As most of the systems support functionalities for processing the merge of patient identities using HL7 messages, standalone LIS systems should also support sending of an HL7 merge message if a patient is merged inside the LIS.

Note:

Patient Administration Management (PAM) enables applications to share accurate patient demographic data within and between acute care settings as well as between those and ambulatory healthcare providers.

The Patient Demographics Query (PDQ) Integration Profile lets applications query a central patient information server and retrieve a patient's demographic and visit information.

Requirements		CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	Legend
5	Ability to exchange patient demographic data	✓	✓	✓	✓	!	✗		✓		!	X - No sharing of patient demographic data ! - Receiving only V - Sending and Receiving
6	Support of IHE PAM	!	!	!	!	✗	✗		✗		!	X - No support of IHE PAM ! - Patient demographics consumer only V - Patient demographics suppliers and consumer
7	Support of IHE PDQ	✗	✗	✗	✗	✗	✗		✗		✗	X - No support of IHE PDQ ! - Patient demographics consumer only V - Patient demographics suppliers and consumer
8	Standard used by labs to transmit these identifying data from the HIS to the LIS	✓	✓	✓	✓	!	✗	✗	✓	✓	✓	X - No standard in usage ! - Proprietary V - HL7 ADT: PID segment
9	Ability to use an external ID	✓	✓	✓	✓	✓	✓		✓		✓	X - No ! - V - Yes

Requirements		CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	Legend
10	Use of an unique patient identifier	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X - No internal unique ID ! - V - Internal unique ID
11	Ability to stronger identify a patient	✓	✓	✓	✓	✓	✗		✓		✓	X - No ! - V - Yes
12	Patient identification dataset	!	✓	✓	✓	!	!	✗	✗	✗	!	X - ! - V -
13	Ability to distinguish real patient id's from temporary / test or non-human patient id's	✓	✓	✓	✓	✓	✓				✓	X - No ! - V - Yes
14	Mechanism used to identify in the LIS an unknown person	!	!	!	!	!	!		!	!	!	X - No rule defined ! - Naming convention or specific range of ID V - Flag
15	Mechanism used to distinguish normal patient and non physical person (e.g. analyses for animals, tests patient IDs etc.)	!	!	✓	✓	✓	!	✗	!	✓		X - No distinction possible ! - Naming convention or specific range of ID V - Flag
16	Mechanism used to merge two patient identities	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	X - No merge ! - V - Can merge patient ID
17	Mechanism used to update of patient identifying demographic data between the connected systems	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	X - No update ! - V - Can update patient demographic data

4.3 Lab report

The eSanté platform requires that the laboratories submit only clinically validated reports with the structure defined in the eSanté-LABO project.

This section investigates how your LIS structures and communicates a lab report. The examination of the answers shows:

- Sharing of laboratory reports using IHE XDS or XD-LAB is not supported by any of the LIS systems. Sharing of the reports is only supported by three vendors by using HL7. The custom based implementations have to be enhanced to support HL7 for this. Thinking about a communication with the eSanté platform, the LIS systems are not able to share the report with the platform. Even if all systems were able to provide the report using HL7 V2.x messages, a communication layer (e.g. connector/gateway) will be needed for the Web-Service access.
- The LIS systems do not support HL7 CDA (Clinical Document Architecture) for their report, instead PDF is the most commonly used external format, but most of the systems support also other kinds of structured and computer processable formats. For sharing the documents using the eSanté platform some additional metadata of the document are needed, which normally are part of the CDA-Header of the report document. Since they don't support CDA, those additional metadata should be transmitted with the HL7 protocol or must be created/generated at the intermediate communication level (e.g. connector/gateway).
- Although LOINC codification is supported by most of the LIS systems, there is no commonly used codification between the laboratories in Luxembourg. The different laboratories are using their own codification.
- The systems are able to distinguish between partial and complete reports. Processing actions on those reports (update/cancel) are also supported by most of the systems. These are import functionalities which are also useful for sharing the reports with the platform, therefore the handling of those messages should be uniform.
- Cumulative reports could be created by most of the systems if needed.

Requirements		CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	Legend
18	Support of IHE XDS and XD-LAB	!	!	!	!	×	×	×	×	×	!	X - No support ! - Planned V - Full support
19	Support of recognised standard for communication	✓	✓	✓	✓	!	!		✓		✓	X - No electronic exchange ! - Proprietary protocol V - HL7 V2
20	Standard used to exchange lab reports between the LIS and other internal systems	✓	✓	✓	✓	!	!	×	✓	✓	✓	X - No electronic exchange ! - Proprietary protocol V - HL7 V2
21	Support of standardised file format for lab report	!	!	!	!	!	!	!	!		!	X - No standard ! - Support PDF V - Support CDA
22	Standard used to exchange lab reports externally	!	×	!	!	!	×	×	×	×	×	X - No electronic communication ! - HL7 V2 + XML V - HL7 CDA
23	Structure of the lab report in usage	✓	✓	✓	!	✓	!	✓		×	✓	X - Not structured ! - Structured and partially computer processable V - Structured and fully computer processable
24	Support of the LOINC codification and codification update functionality	✓	✓	✓	✓	✓	✓		✓		✓	X - No usage possible ! - V - Mapping to LOINC

Requirements		CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	Legend
25	Support of the IHE LCSD profile	!	!	!	!	×	×	×	×		!	X - No support ! - Code set Master V - Code set Consumer
26	Ability to distinguish partial and complete report	✓	✓	✓	✓	✓	✓		✓		✓	X - No distinction ! - V - Distinction
27	Management of partial report by labs	✓	✓	✓	✓	✓	✓	✓	✓	✓	!	X - No update ! - Addendum V - Cancel / Replace
28	Ability to manage the update of a complete report	✓	✓	✓	✓	✓	!				✓	X - No update ! - Addendum V - Cancel / Replace
29	Management of the update of complete report (error) by lab	✓	✓	✓	✓	✓	!	✓	✓	✓	✓	X - No update ! - Addendum V - Cancel / Replace
30	Ability to create cumulative report	✓	✓	✓	✓	✓			✓		✓	X - No ! - V - Yes
31	Usage of cumulative report	✓	×	✓	×	!	✓	×	✓	✓	!	X - No support ! - Only on screen or online V - In paper
32	Ability to manage measurement unit	✓	✓	✓	✓	✓	!				✓	X - Only one unit ! - IS and conventional unit V - IS and conventional unit + converter
33	Management of measurement units by labs	!	✓	✓	✓	!	✓	✓	✓	✓	!	X - ! - IS or conventional V - IS and conventional
34	Ability to cancel a lab report	✓	✓	✓	✓	✓	✓				✓	X - No ! - V - Yes
35	Domains covered by labs	✓	✓	✓	✓	!	!	×	✓	✓	!	X - Less than the 4 main domains ! - The 4 main domains V - More than the 4 main domains
36	Storage of the lab report by labs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X - Not stored in LIS ! - V - Stored in LIS
37	Number of models of report managed by labs	!	✓	!	!	✓		✓	✓	✓	!	X - one model ! - More than 10 models V - 2 to 9 models
38	Lab accredited ISO 15189	!	!	✓	✓	✓	!	!	✓	✓	✓	X - Not accredited ! - In process of accreditation V - Accredited
39	Communication of the lab report with the patient by lab	!	!	!	!	!	!	!	!	!	!	X - Not send to patient ! - Send on the demand of the patient V - Always send to the patient
40	Use of graphics inside the report	✓	✓	✓	!	!	!	!	✓	✓	!	X - Support graphics ! - Plan to do it V - Do it

4.4 Metadata linked to the lab report

Each lab report is linked to an administrative context (patient identification) and a clinical context (lab test). Data associated with these contexts are called metadata. In order to enable the data exchange platform eSanté to process metadata associated with the lab report (= make the information understandable for all the different actors and usable for anonymous statistics) it is necessary to standardize these data to a maximal degree.

This section studies this data associated to the clinical context (metadata). The examination of the answers shows:

- Although, the systems are not able to create CDA documents with a set of appropriate CDA Header metadata, labs are able to provide most of the metadata suggested, to allow another system (e.g. the connector to the platform) to use those metadata to create the appropriate protocol for communication with the platform.

According to LIS provider answers, 13 of 27 Metadata suggested in the questionnaire are available in all LIS. Metadata that have an index of availability superior to 75% is:

- Document title [title]
- Laboratory identification [authorInstitution]
- Prescriber name [intendedRecipient]
- Prescription ID [OrderId]
- Prescription date
- Other physician in copy [intendedRecipient]
- Copy for the patient [intendedRecipient]
- Lab test domains (e.g. Haematology, biochimy...)
[typeCode]
- Type of specimen (blood, urine, stools, biopsy ...)
- Test done in emergency
- Document format (e.g. CDA + xslt, PDF)
- Specimen taking date (Prélèvement) or Brought date (Apporté)
- Specimen reception time (day, hour and minutes)
- Comments of documents [comments]
- Internal report reference [Uniqueld]
- Biologist validating the lab report (name)
[legalAuthenticator]
- Report validation time (day, hour and minutes)
- Partial result OR summary report
- Abnormal biologic result classification
- Language [languageCode]

Requirements		CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	Legend
41	Ability to use metadata	✓	✓	✓	✓	✓	✓		✓		✓	X - Less than 49% of the Metadata are in the LIS ! - Superior to 50% of the Metadata are in the LIS V - Superior to 70% of the Metadata are in the LIS
42	Metadata used in the LIS	!	✗	✓	!	✓	✗	✗	✗	!	!	X - Less than 49% of the Metadata are in the LIS ! - Superior to 50% of the Metadata are in the LIS V - Superior to 70% of the Metadata are in the LIS
43	Standards available to exchange metadata with other internal systems	✓	✓	✓	✓	!	!		✓		✓	X - No exchange ! - Proprietary V - HL7 V2
44	Standards used to exchange metadata with other internal systems	✓		✓	✗	!	!	✗	✗	✓	✗	X - No send ! - Proprietary V - HL7 V2
45	Ability to add metadata	!	!	!	!	✓	✓		✗		✓	X - No ! - It depend V - Yes
46	Ability to add external identifier for document	✓	✓	✓	✓	✓	✓		✓		✗	X - No ! - V - Yes
47	Data used by labs to retrieve a lab result	-	-	-	-	-	-	-	-	-	-	No assessment
48	Identification used for the receiver (prescriber)	✓		✓	✓	✓	✓	!	✓	✓	✓	X - No identification ! - Internal ID V - CNS code

4.5 User authentication

The platform requires that user are strongly identified.

This section aims to understand the user authentication scheme of your system. The examination of the answers shows:

- Many of the laboratory systems are able to use external services for authentication and some systems are able to use stronger authentication credentials than username and password.
- None of the systems provides security functionalities as defined by the IHE ATNA, EUA or XUA profile. ATNA and XUA will be basic profiles, which should be used by the eSanté platform.
- For the communication with the eSanté platform, most of the system are not able to support the integration of a security token service with the exchange of user credentials for the eSanté platform. This authentication mechanism could be also managed by the connector.

Note:

The Audit Trail and Node Authentication (ATNA) Integration Profile establishes security measures which, together with the Security Policy and Procedures, provide patient information confidentiality, data integrity and user accountability.

Cross-Enterprise User Assertion Profile (XUA) - provides a means to communicate claims about the identity of an authenticated principal (user, application, system...) in transactions that cross enterprise boundaries. To provide accountability in these cross-enterprise transactions there is a need to identify the requesting principal in a way that enables the receiver to make access decisions and generate the proper audit entries.

The Enterprise User Authentication (EUA) Integration Profile defines a means to establish one name per user that can then be used on all of the devices and software that participate in this integration profile. This profile leverages Kerberos (RFC 1510) and the HL7 CCOW standard (user subject). User authentication is a necessary step for most application and data access operations and it is a workflow improvement for the users.

Requirements		CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	Legend
49	Support of external system for authentication	✓	✓	✓	✓	✓	✓		✓		✓	X - No ! - V - Yes
50	Support of authentication mean	✓	✓	✓	✓	✓	!		✓		✓	X - No authentication mean ! - Username and password V - Card or fingerprint
51	Support of IHE ATNA, EUA and XUA	✗	✗	✗	✗	✗	✗		✗		✗	X - No support of these profiles ! - V - Support at least one of these profiles

4.6 Electronic signature

Each document sent to the platform has to be sign by the user.

This section aims to understand the user signature scheme of your system. The examination of the answers shows:

- The systems support the validation of laboratory reports by system internal means. For sharing reports with the platform, the usage of an electronic signature helps to enforce non repudiation and to prove the immutability of the report. None of the systems provides such functionality or workflow integration.

Requirements		CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	Legend
52	Support of a qualified electronic signature	✗	✗	✗	✗	✗	✓		!		✗	X - No support electronic signature ! - In development process V - Support electronic signature
53	Integration of the signature in the workflow	✓	✓	✓	✓	✓	✓		✓		✓	X- Biologist electronic signature ! - V- Institutional electronic signature
54	Document supported by the electronic signature	✗	✗	✗	✗		✓		!		✗	X - No signature supported ! - Sign PDF V - Sign all files
55	Support of XAdES or IHE DSG	✗	✗	✗	✗	✗	✗		✗		✗	X - No support ! - V - Support

4.7 Miscellaneous

This section does not focus on one specific topic, it deals with the Public/Private Key Infrastructure (PKI), subcontracting workflow and project experiences / references of the LIS provider. The examination of the answers shows:

- Integrating the laboratory system into a new or existing Public/Private Key Infrastructure (PKI) to enable signature and encryption is one thing, which could be useful for the eSanté integration. Only one system seems to be able to integrate a PKI, although such integration has to be verified, because such systems often only support vendor specific PKI implementations.
- Subcontracted results can be managed in most of the case by point to point mapping and in other cases with a PDF attachment. The integration of the result of the subcontracting lab in a complete report is not common usage, this practice should be developed to make the reading of such document easier for the end users.
- None of the LIS provider has any experience with national project.

Requirements		CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	Legend
56	Ability to integrate of a PKI	✗	✗	✗	✗	✓			✗		✗	X - No ! - V - Yes
57	Support of IHE ILW	✗	✗	✗	✗	✗	✗				!	X - No support ! - Support without option V - Full support
58	Support of the subcontracting workflow	✓	✓	✓	✓	!	✗		✓		✓	X - No ! - PDF attachment V - Point to point mapping
59	Subcontracting lab behaviour	✗	✓	✗	!	✗	✗		✓	✓	✗	X- The subcontracting lab is responsible ! - V- The lab that take the sample is responsible
60	LIS provider project reference	✗	✗	✗	✗	✗	✗		✗		✗	X - No reference ! - V - Reference at least in one project with IHE XD-LAB

4.8 Main conclusions

The examination of the questionnaires and this interoperability matrix shows the need to use a specific communication layer between the LIS and the eSanté platform based on a gateway/connector service at least for a short term perspective. One side communicates with the LIS systems using HL7 v2.x and on the other side using Web-Service communication for the platform transactions. This communication layer will be at least in charge of the de-identification of the report, the security token service and the transformation of the available metadata in the desired structure. This kind of implementation can be observed for instance in region in France like Franche-Comté or Alsace.

This work will be now completed with the study of the gap analyse comparing the requirements of the eSanté platform and the capacity of each lab to achieve to interoperate with the platform.

5. Detailed answers

5.1 How to read the table


The CR SANTEC designed a model table to analyse each answer from the two questionnaires. The eSanté team regrouped in a model table the answers of the questionnaire collected during the interviews in order to analyse each answer from the two questionnaires.

The first row indicates the general requirement related to the question and the second row is reminder of the question.

Then the third row resumes the answers collected. When possible, in same row is placed some individual indicator of the impact of the current situation of the Lab or the LIS vis-à-vis the eSanté platform. A legend of this criteria is placed just below these individual assessments.

The fourth row is a general description of the impact that informs at glance the complexity of change that the LIS in general will require to be compliant with the platform.

This table is represented below with each field described.

Requirement #	Here is the general requirements described in this block															
Question(s)	Here is the reference to the question answered															
Synthesis of the current implementation	Here is the description of the state of practice regarding the requirements.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							✗	!	✓	✗	!	✓	✗	!	✓	✗
Effort to implement	 Here is described the general effort of the field to reach eSanté requirement.						Criteria		Here is the description of the indicator used (✗, !, and ✓) to assess the current state of each lab.							
Comment	Additional information															

The three pictograms used to describe the general complexity of change of the actors mean:



No change is needed.

Some changes have to be planned.

Changes are required.

5.2 Architecture

Requirement 1	Integration of the LIS with another IS															
Question(s)	Q 4.2-1 Is your LIS System a standalone solution or is it a part of another information system (e.g., HIS)?															
Synthesis of the current implementation	LIS developed by software company can work standalone or integrated with an HIS. OSM has a partnership with Agfa ORBIS. FS and MAGIC developed a standalone system and the CHdN developed its LIS embedded in the HIS.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							✓	✓	✓	✓	!	×	×	✓	✓	✓
Effort to implement							Criteria ×- Standalone ! - Module of a HIS ✓- Integrated									
Comment	For integrated system, it is possible that the interoperability with external system is managed at another level than the LIS module, such as the EAI module.															

Requirement 2	List of standard supported															
Question(s)	Q 4.2-2 Which standard protocols (e.g., HL7) for communication / integration are supported by your applications?															
Synthesis of the current implementation	HL7 v2.2 to 2.5 is the main standard used, some use also HPRIM Santé 2.2, LDT and HCM. The CHDN is also able to use XML and ASTM. OSM uses ASTM POCT-1A in the device communication area.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							✓	✓	✓	✓	✓	×	×	✓		✓
Effort to implement							Criteria ×- Other standards ! - ✓- HL7 v2.x based									
Comment																

Requirement 3	List of IHE profiles supported															
Question(s)	Q 4.2-3 Have you joined with your software the IHE Connectathon for testing the connectivity with other systems. If yes, could you provide the Integration Statement document for the software version where this questionnaire relates to?															
Synthesis of the current implementation	FS, CHdN, MAGIC and OSM did not integrate any IHE profiles.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							✓	✓	✓	✓	×	×	×	×		!
Effort to implement							Criteria ×- No IHE profile supported ! - Implemented without integration statement ✓- Implemented with integration statement									
Comment	Only 80% of scenarios are covered by IHE															

Requirement 4	List of IHE profiles planned to be implemented															
Question(s)	Q 4.2-4 Do you plan to implement additional IHE profiles and if so which and when?															
Synthesis of the current implementation	MIPS plan to integrate in 2012 IHE XD-LAB and LCSD French extension for the DMP in France. They plan to use an external module to make their system interoperable.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							✓	✓	✓	✓	×	×	×	×		×
Effort to implement							Criteria ×- No plan ! - ✓- Plan to implement additional IHE profiles									
Comment	The French extension of the LCSD is useful for specialised lab like Cerba															


MIPS GLIMS		
IHE Integration Profile implemented	Actor implemented	Integration Profile Option
Consistent Time	Time Client	
Laboratory Code Set Distribution	Code Set Master	
Laboratory Testing Workflow	Department system scheduler/Order Filler	
Patient Administration Management	Patient Demographics Consumer	Merge
Patient Administration Management	Patient Encounter Consumer	Inpatient / Outpatient Encounter Management


Cegeka		
IHE Integration Profile implemented	Actor implemented	Integration Profile Option
Laboratory Testing Workflow	Order filler	
Laboratory Testing Workflow	Order placer	
Laboratory Testing Workflow	Automation Manager	
Laboratory Point Of Care Testing	Order filler	
Laboratory Point Of Care Testing	Order placer	
Inter Laboratory Workflow	Order filler	
Inter Laboratory Workflow	Order placer	


General comment from MIPS:

- Please pay attention that IHE-LAB has a lot of workflows supported by using HL7 2.5. A statement as if a support of HL7 2.5 solves all your requirements will lead to false project expectations...
- As a member of IHE international, we have to warn local organizations about the incompleteness of scenarios. This may lead to extending the international standard or it may require a dedicated national extension.
- An interface between an LIS and the external world is not necessarily related to the version of the LIS. In our situation with GLIMS, the interface is supported using dedicated drivers which are to be seen as individual products that communicate with GLIMS and the external world. Upgrading to a new driver may provide answers without the need upgrading the entire GLIMS.
- in 2009 and 2010 we have participated to the European Connectathon. Our integration statement can be found on our WEB : <http://www.mips.be/index.cfm?lang=en&country=be&cid=m&pid=2&psid=1&ModuleSeqNo=160>

5.3 Patient ID

Requirement 5	Ability to exchange patient demographic data															
Question(s)	Q 4.3-1 Does your system support the sharing (sending/receiving) of patient demographic data with other systems (e.g. HIS)?															
Synthesis of the current implementation	In most case, the LIS has a functionality to receive patient demographic data from the HIS, via HL7 v2: ADT – PID segment. The CHdN use a SQL request. GLIMS is able to send this data to a publishing server (e.g. Cyberlab) via HL7 v2: ADT – PID segment.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
Effort to implement	 Many LIS have the capacity to receive patient demographic data but few LIS have the capacity to send it. As a data provider, labs have to send patient demographic data.						Criteria									
Comment	FS: it can be implemented as needed															
							✓	✓	✓	!	×		✓		!	
							×- No sharing of patient demographic data ! - Receiving only ✓- Sending and Receiving									

Requirement 6	Support of IHE PAM															
Question(s)	Q 4.3-2 Does your system support the IHE – Patient Administration Management (PAM) profile and if so, which actors and options?															
Synthesis of the current implementation	GLIMS and CEGEKA support the Patient demographics consumer actor. CEGEKA supports all supplementary options (Merge, Link, Unlink), while GLIMS only supports "Merge" options.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
Effort to implement	 In the configuration of the platform with matching algorithm, patient demographics suppliers will be interesting, but it is no support and not in the development roadmap of the LIS provider.						Criteria									
Comment																
							!	!	!	!	×	×		×		!
							×- No support of IHE PAM ! - Patient demographics consumer only ✓- Patient demographics suppliers and consumer									

Requirement 7	Support of IHE PDQ															
Question(s)	Q 4.3-3 Does your system support the IHE – Patient Demographics Query (PDQ) profile for sharing patient demographic and encounter data and if so, which actors and options?															
Synthesis of the current implementation	No LIS supports IHE PDQ						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
Effort to implement	 No LIS provider plan to implement it. This profile could be useful to see patient identification data when looking for lab results from other labs on the platform.						Criteria									
Comment																
							×	×	×	×	×		×		×	
							×- No support of IHE PDQ ! - Patient demographics consumer only ✓- Patient demographics suppliers and consumer									

Requirement 8	Standard used by labs to transmit these identifying data from the HIS to the LIS										
Question(s)	Q1-5 Which standard(s) is (are) used to transmit these identifying data from the HIS to the LIS?										
Synthesis of the current implementation	All hospital labs except the CHdN use the PID segment of the HL7 ADT. Other labs do not need to communicate with another information system.										
Effort to implement	HL7 ADT could be used as protocol to transmit these identifying data to the connector. If this standard is chosen, lab that already use it have to manage its configuration and the others have more effort to implement it.										
Comment											
	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	
	✓	✓	✓	✓	!	×	×	✓	✓	✓	
	Criteria ×- No standard in usage ! - Proprietary ✓- HL7 ADT: PID segment										

Requirement 9	Ability to use an external ID										
Question(s)	Q 4.3-4 Is your system able to use unique patient identifiers from other systems, e.g., a MPI system of an institution, and if so how?										
Synthesis of the current implementation	All patients may have multiple identifications originated by different providers. The internal unique and permanent Patient ID is mapped to unique identifiers from other systems.										
Effort to implement	No effort required										
Additional comment											
	GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka	
	✓	✓	✓	✓	✓	✓		✓		✓	
	Criteria ×- No ! - ✓- Yes										


Requirement 10	Use of an unique patient identifier										
Question(s)	Q1-1 Which patient identifier is used inside the LIS? Q1-2 How are identified EU agents and foreigner patients without matricule? Q1-3 How do you manage the patient identification with subcontractor?										
Synthesis of the current implementation	Hospital labs uses the patient ID of the HIS and extra-hospital uses the PID of the LIS. Each lab set its own rule to create an internal PID for patient without matricule. There is no general rule. To identify the patient in subcontracting, all labs send names, address and matricule. Some add their internal PID.										
General effort to implement the requirement	Each lab identifies uniquely their patients. There's no common identifier used for all Lab's, even if the matricule is most often provided. To assure correct identification of patients at national level, it is necessary to use an identification dataset to manage the identity of the patient, included the matricule, at the platform level.										
Comment											
	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Criteria ×- No internal unique ID ! - ✓- Internal unique ID										


Requirement 11	Ability to stronger identify a patient										
Question(s)	Q 4.3-5 Does your system support further information features to stronger identify patients, for example biometrical data?										
Synthesis of the current implementation	Some LIS have implemented a matching algorithm through a comparison verification of different datasets and propose a match or block a merge based on the content of the dataset. The CHdN uses also the ID of the bracelet of the patient.										
Effort to implement	No implementation asked										
Comment											
	GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka	
	✓	✓	✓	✓	✓	×		✓		✓	
	Criteria ×- No ! - ✓- Yes										


Requirement 12	Patient identification dataset									
Question(s)	Q1-4 Which components of patient identification data can you provide?									
Synthesis of the current implementation	<p>According to the answer collected, two identification datasets have been retained. The general identification dataset is composed of attributes that have an index of availability superior to 75%. The additional identification dataset is composed of attributes that have an index of availability between 50% and 75%.</p> <p>The general identification dataset is:</p> <ul style="list-style-type: none"> • Patient ID (Internal ID) • Patient Name • Date/Time of Birth • Sex • Country Code <p>The additional identification dataset is:</p> <ul style="list-style-type: none"> • Mother's Maiden Name • Patient Address • Matricule 									
Effort to implement	<p>The defined general identification dataset is able to identify a patient, but the use of the additional dataset is needed to avoid any merge of two different patients. The availability of this dataset is not high. Some efforts have to be done to provide sufficient demographic data to the platform to have a correct identification of the patients.</p>									
Comment	CRL, CHEM and FFE receive a ×, because they can not provide their internal ID.									
	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK
	!	✓	✓	✓	!	!	×	×	×	!
	Criteria					<p>×- have less than the gen. Id dataset</p> <p>! - have the gen. Id. dataset</p> <p>✓- have the add. Id. dataset</p>				

Requirement 13	Ability to distinguish real patient id's from temporary / test or non-human patient id's									
Question(s)	Q 4.3-6 Does your system support the usage of criteria to distinguish real patient id's from temporary/test or non-human patient id's?									
Synthesis of the current implementation	All LIS can distinguish real patient id's from temporary / test or non-human patient id's by number range or a flag.									
Effort to implement	<p>No effort required</p>									
Comment										
	GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
	✓	✓	✓	✓	✓	✓				✓
	Criteria					<p>×- No</p> <p>! -</p> <p>✓- Yes</p>				

Requirement 14	Mechanism used to identify in the LIS an unknown person									
Question(s)	<p>Q1-6 How do you manage the identification of a person who cannot be identified (e.g. in emergencies, analysis under "X", VIP ...)?</p> <p>Q1-7 If you use temporary patient IDs do you have a means to distinguish them from definite IDs?</p> <p>Q1-8 How do you distinguish unidentified data (e.g. in emergencies, analysis under "X", VIP ...) from identified data?</p>									
Synthesis of the current implementation	<p>It concerns only the emergency case of hospital labs, analysis under "X" are not concerned by the platform.</p> <p>In most of the case, a temporary ID is given to the unknown patient from the HIS/LIS, and this ID will be merged with his definitive ID after he has been identified.</p> <p>Temporary IDs are distinguished by a naming convention or a specific range of ID or the absence of PID.</p> <p>Unidentified data are distinguished mostly by a naming convention. Only one lab use a specific range of ID and another one the absence of PID.</p> <p>The LNS receives the temporary ID from the hospital or the hospital lab (number, « X », etc.), and then merge with the real identity when available.</p>									
Effort to implement	<p>There is a risk to receive patient temporary ID and unidentified data. All labs have to set up a filter to prevent these issues. To be more secure the connector could also filter unexpected data.</p>									
Comment										
	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK
	!	!	!	!	!	!	!	!	!	!
	Criteria					<p>×- No rule defined</p> <p>! - Naming convention or specific range of ID</p> <p>✓- Flag</p>				

Requirement 15	Mechanism used to distinguish normal patient and non physical person (e.g. analyses for animals, tests patient IDs etc.)										
Question(s)	Q1-9 Are there unique patient identifiers in the HIS/LIS, which do not correspond to physical persons (e.g. analyses for animals, tests patient IDs etc.)? Q1-10 If these identifiers are distinguishable from normal patient IDs, how do you distinguish them?										
Synthesis of the current implementation	Just one hospital has only patient data in its LIS and no tests or animals. Not-physical-person data is distinguished by naming convention or a flag. GLIMS seems to have implemented special types of analysis for test.										
Effort to implement	 There is a risk to receive data not linked to a patient. All labs have to set up a filter to prevent this issue. To be more secure the connector could also filter this unexpected data.										
Comment	Only labs that need this functionality implemented it.										
	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	Criteria
	!	!	✓	✓	✓	!	✗	!	✓		x- No distinction possible ! - Naming convention or specific range of ID ✓- Flag

Requirement 16	Mechanism used to merge two patient identities										
Question(s)	Q1-11 In which system is the merging of two patient identities done? Q1-12 If you merge the patient ID, which communication protocol do you use?										
Synthesis of the current implementation	For hospital lab: The merge is done in the HIS and then forwarded to the LIS. HL7 Message is mostly used to communicate the merge to the LIS. For extra-hospital lab: The merge is done directly in the LIS.										
Effort to implement	 The merge of patient seems to be managed carefully.										
Comment											
	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	Criteria
	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	x- No merge ! - ✓- Can merge patient ID

Requirement 17	Mechanism used to update of patient identifying demographic data between the connected systems										
Question(s)	Q1-13 How is the updating/changing of patient identifying demographic data handled between the connected systems? Q1-14 If you handle the update of administrative data, which communication protocol do you use?										
Synthesis of the current implementation	For Hospital lab: The update of administrative data is done in the HIS and then forwarded to the LIS by HL7 Message: A31. CHdN uses its own method. For LNS: Both LIS are independents -> no connection between them.										
Effort to implement	 The update of administrative data is well managed by a standard process.										
Comment											
	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	Criteria
	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	x- No update ! - ✓- Can update patient demographic data

5.4 Lab report


Requirement 18	Support of IHE XDS and XD-LAB										
Question(s)	Q 4.4-1 Does your system support the IHE Cross-Enterprise Document Sharing (XDS or XDS.b) profile and which actors? Q 4.4-2 Does your system support the IHE Sharing Laboratory Reports (XD-LAB) profile and which actors?										
Synthesis of the current implementation	No LIS provider supports or plan to support IHE XDS. No LIS provider supports or plan to support IHE XD-LAB. MIPS plan to implement it for 2012 if the French project DMP pay for it.										
Effort to implement	As no LIS provider is ready to use XD-LAB profile, the connector is necessary to exchange data with the platform.										
Comment	According to MIPS, the content creator actor is not used in the world. Nevertheless 12 companies are cited in the IHE website to have pass the test : AGFA Healthcare, BlueWare, eClinicalWorks, GE Healthcare, International Business Machines, InterSystems Corporation, IZASA, MEDecision, Open Health Tools, SuccessEHS, Systelab Technologies S.A., Tiani-Spirit GmbH. Cegeka has implemented XDS one time for the CH of Louvain but it should be XDS.a										
	GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka	
	!	!	!	!	X	X	X	X	X	!	
	Criteria										x- No support ! - Planned ✓- Full support

Requirement 19	Support of recognised standard for communication										
Question(s)	Q 4.4-3 Based on which standard(s) are lab reports exchanged between the LIS and other systems (publishing, archiving, administrative...)?										
Synthesis of the current implementation	GLIMS and Cegeka use mainly HL7 v2 but are compliant with HPRIM, LDT and the 27 standards of Belgium. OSM supports HL7-ORU, LDT, HL7-MDM. FS uses proprietary standard. CHdN uses direct query of its database.										
Effort to implement	HL7 ORU message could be used to exchange with a connector.										
Comment											
	GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka	
	✓	✓	✓	✓	!	!		✓		✓	
	Criteria										x- No electronic exchange ! - Proprietary protocol ✓- HL7 V2

Requirement 20	Standard used to exchange lab reports between the LIS and other internal systems										
Question(s)	Q2-13 Based on which standard(s) are lab reports exchanged between the LIS and other internal systems (publishing, archiving, administrative...)?										
Synthesis of the current implementation	HL7 Message V2 is mostly used to exchange lab report between the LIS and internal systems. Labs that are not using HL7 use a proprietary protocol.										
Effort to implement	HL7 Message V2 could be used by the LIS to communicate lab reports to eSanté through a connector.										
Comment											
	CHL	LNS	KT	LR	CHdN	FS	CRL	CHEM	FFE	ZK	
	✓	✓	✓	✓	!	!	X	✓	✓	✓	
	Criteria										x- No electronic exchange ! - Proprietary protocol ✓- HL7 V2

Requirement 21	Support of standardised file format for lab report									
Question(s)	Q 4.4-4 Which formats for reports does your system support (e.g., CDA, PDF)? Q 4.4-5 If CDA is supported, how flexible is the software to configure the export of CDA documents based on national templates?									
Synthesis of the current implementation	CDA is not supported by none. PDF is the only standard supported. OSM supports also structured ORU data, XML and LDT									
Effort to implement	🚩 High effort to implement CDA is necessary									
Comment										
	GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
	!	!	!	!	!	!		!		!
	Criteria									
	x- No standard ! - Support PDF ✓- Support CDA									

Requirement 22	Standard used to exchange lab reports externally									
Question(s)	Q2-14 If you communicate your lab report electronically, what standard(s) do you use?									
Synthesis of the current implementation	Four labs have no electronically communication. Structure: None of the labs supports HL7 CDA. Six labs support the format XML of HealthNet and four can create some PDF or RTF. Transport: Four labs use HL7 message V2 for the communication. Some Labs use FTP with HealthNet									
Effort to implement	🚩 The CDA structure has to be supported by all labs. HL7 message V2 may be used for the communication with a connector which could create the CDA.									
Comment										
	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK
	!	x	!	!	!	x	x	x	x	x
	Criteria									
	x- No electronic communication ! - HL7 V2 + XML ✓- HL7 CDA									

Requirement 23	Structure of the lab report in usage										
Question(s)	Q2-7 Is your lab report structured? Q2-8 If yes, what is the content structure of your lab report?										
Synthesis of the current implementation	<p>Reports are structured and partially to fully processable. There is no common structure except for HealthNet.</p> <p>To give an outlook, we listed below a not representative content structure.</p> <p>Header:</p> <ul style="list-style-type: none"> - Internal order id - External order id - Internal report reference - Specimen reception date - Patient Information - Title - Name - Address - Birth date - Matricule - Recipient address (Prescriber, Other physician) - Title - Name - Address - Copy information summary - If the recipient is the Prescriber: a list of all other physician in copy - If the recipient is another physician in copy: prescriber information <p>Body:</p> <ul style="list-style-type: none"> - Results - Result Group (Haematology, Biochimie, Hormonologie, ...) - Titles - Result Lines - Test label - Numeric result - Percentage result - Interpretation result - Normal value range - Pathological result indicator - Unit - Previous result value - Previous result date - Bacteriology - Cultures - Type (Antibiogramme, Antifongogramme) - Germ - Sample source - Sample date - Antibiotic Reaction results - Antibiotic molecule name - Antibiotic ID - Antibiotic commercial product names - Reaction interpretation (Sensitive, Intermediate, Resistant) - CMI value in mg/l - CMI thérap. range - Recommendation indicator - Comment <p>Conclusion:</p> <ul style="list-style-type: none"> - Comments - Report date - Biologist validating the lab report 	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK
Effort to implement	 A standardized structure has to be defined by the actor of the sector and eSanté team in the framework of this project.	Criteria									
Comment	This list could be used to start the definition of the structure of a CDA template. CDA document will be created on the data stored in the database of the LIS.										

Requirement 24	Support of the LOINC codification and codification update functionality															
Question(s)	Q 4.4-6 Is LOINC codification directly supported, or can your internal codification be mapped to a national LOINC codification? Q 4.4-7 How does your software manage the update of the codification?															
Synthesis of the current implementation	As LOINC is proprietary, LIS uses their own codification that can be mapped to LOINC. But LOINC does not cover completely all domains.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							✓	✓	✓	✓	✓	✓		✓		✓
Effort to implement	🚩 No effort at the LIS provider level. This is a manual labour in charge of the laboratory organisation.						Criteria x- No usage possible ! - ✓- Mapping to LOINC									
Comment	CHDN used it in a POC with the CHL.															

Requirement 25	Support of the IHE LCSD profile															
Question(s)	Q 4.4-8 Does your system support the Laboratory Code Set Distribution (LCSD) integration profile?															
Synthesis of the current implementation	LIS providers implemented the Code set Master actor in order to update (send) the codification of their publishing server.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							!	!	!	!	×	×	×	×		!
Effort to implement	🚩 In order to have a national update of the Lux-LOINC code set, the code set consumer actor could be more useful. As LIS editors know this profile, the effort should not be so big.						Criteria x- No support ! - Code set Master ✓- Code set Consumer									
Comment																

Requirement 26	Ability to distinguish partial and complete report															
Question(s)	Q 4.4-9 How are partial results and complete reports distinguished? Q 4.4-10 Are published partial reports updated? And if so, how?															
Synthesis of the current implementation	Partial and complete reports are distinguished by flag and status report. Update of partial report is made by a new version and PDF Addendum can be also use. The kind of the emitted report (addendum, replacing) is set by parameters. In HL7 message, the designated identifiers is change as below: findings: ORC-5 = SC (started), IP (in process), CM (finished) results: OBR-25 = S (started), P (temporary), F (final) ...						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							✓	✓	✓	✓	✓	✓		✓		✓
Effort to implement	🚩 No effort to implement						Criteria x- No distinction ! - ✓- Distinction									
Comment	2 scenarios of new partial result can be set by parameter: - Difference from the previous - Integration of the previous															

Requirement 27	Management of partial report by labs															
Question(s)	Q2-3 Do you send partial lab results to the prescriber? Q2-4 How are partial results and summary reports distinguished? Q2-5 Are published partial reports updated? And if so, how?															
Synthesis of the current implementation	All labs send partial results to the prescriber except the case of CRL. FFE and CHL do it only for internal prescribers. Partial reports are distinguished by their status and their name. For update of partial report, the new version replaces the previous one, except for ZK who uses an addendum.						CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK
							✓	✓	✓	✓	✓	✓	✓	✓	✓	!
Effort to implement	🚩 eSanté has to manage partial reports. Partial reports can clearly be distinguished. For update, the new version number has to be sent also to the platform.						Criteria x- No update ! - Addendum ✓- Cancel / Replace									
Comment	Addendum have not been examined in the eSanté use case definition, but it can be managed in the functional requirement with IHE and HL7 CDA convention.															

Requirement 28	Ability to manage the update of a complete report															
Question(s)	Q 4.4-11 Are published complete reports updated? And if so, how?															
Synthesis of the current implementation	Validated reports are invalidated. Then, modifications are done and then the report is validated and published again.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Gegeka
							✓	✓	✓	✓	✓	!				✓
Effort to implement	🚩 No effort to implement						Criteria					x- No update ! - Addendum ✓- Cancel / Replace				
Comment																

Requirement 29	Management of the update of complete report (error) by lab															
Question(s)	Q2-6 Are published complete reports updated? And if so, how?															
Synthesis of the current implementation	Most of the labs just invalid the previous report and replace it by new without new version number. Others labs create a new version and one makes an addendum						CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK
							✓	✓	✓	✓	✓	!	✓	✓	✓	✓
Effort to implement	🚩 The platform has to manage new version and addendum. Labs have to inform eSanté about the nature of the new document.						Criteria					x- No update ! - Addendum ✓- Cancel / Replace				
Comment	A standardisation of the practice could be interesting for end user.															

Requirement 30	Ability to create cumulative report															
Question(s)	Q 4.4-12 Are the LIS able to create cumulative reports with anteriority of different encounters with the patient and if so is the LIS able to transmit it as a document?															
Synthesis of the current implementation	Different implementations are in place. Transmission through HL7-MDM or HL7-OUL.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Gegeka
							✓	✓	✓	✓	✓			✓		✓
Effort to implement	🚩 No effort to implement						Criteria					x- No ! - ✓- Yes				
Comment																

Requirement 31	Usage of cumulative report															
Question(s)	Q2-10 Does your laboratory create cumulative reports with anteriority of different encounters with the patient?															
Synthesis of the current implementation	In general, cumulative reports are created in paper only on the demand of a physician. Some labs offer to the physician to see these results online.						CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK
							✓	✗	✓	✗	!	✓	✗	✓	✓	!
Effort to implement	🚩 Labs will be in charge of the creation of cumulative reports.						Criteria					x- No support ! - Only on screen or online ✓- In paper				
Comment																

Requirement 32	Ability to manage measurement unit															
Question(s)	Q 4.4-13 What is the system of codes used today to express the measurement units inside a report? Q 4.4-14 Is your LIS able to convert measurement units?															
Synthesis of the current implementation	This parameter is set by the lab organisation, it depend on the instrument used for the measure. International System and Conventional are generally managed.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							✓	✓	✓	✓	✓	!				✓
Effort to implement	No effort to implement						Criteria x- Only one unit ! - IS and conventional unit ✓- IS and conventional unit + converter									
Comment																

Requirement 33	Management of measurement units by labs															
Question(s)	Q2-12 What is the system of codes used today to express the measurement units inside a report?															
Synthesis of the current implementation	Most of the labs use the International System (mmol/L) or the conventional unit (gr/L) to express the measurement unit inside a report. Some labs made the choice to have reports with the two unit systems.						CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK
							!	✓	✓	✓	!	✓	✓	✓	✓	!
Effort to implement	eSanté has to support both unit systems. The measure unit will be managed by the labs in the CDA report. The proposed national CDA template and its corresponding stylesheet of the lab have to foresee this.						Criteria x- ! - IS or conventional ✓- IS and conventional									
Comment	The lab should have the choice of the unit inside the report.															

Requirement 34	Ability to cancel a lab report															
Question(s)	Q 4.4- additional: Is your LIS able to cancel a lab result and how?															
Synthesis of the current implementation	Yes via a HL7 message or for CHdN flag "ERROR"						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							✓	✓	✓	✓	✓	✓				✓
Effort to implement	No effort to implement						Criteria x- No ! - ✓- Yes									
Comment	In CHDN: 3 cases only in 12 years															

Requirement 35	Domains covered by labs															
Question(s)	Q2-1 Which domain do you cover and for which domain do you send lab results electronically?															
Synthesis of the current implementation	The main domains covered are: • Microbiology • Haematology • Biochemistry • Immuno-Allergoly All labs except LNS manage electronically the publication of the report of these domains. CRL covers only the haematology domain and in paper.						CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK
							✓	✓	✓	✓	!	!	✗	✓	✓	!
Effort to implement	eSanté could start only with these four domains for the first iteration						Criteria x- Less than the 4 main domains ! - The 4 main domains ✓- More than the 4 main domains									
Comment																

Requirement 36	Storage of the lab report by labs										
Question(s)	Q2-2 Where is stored the report?										
Synthesis of the current implementation	Lab report are not stored in the LIS, they are generated on demand based on the data stored in the data base of the LIS. Some labs copy lab report to other systems (publishing server).										
Effort to implement	The LIS can be considered as the unique source to retrieve lab report.										
Comment											
	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Criteria x- Not stored in LIS ! - ✓- Stored in LIS										


Requirement 37	Number of models of report managed by labs										
Question(s)	Q2-9 How many models of reports do you manage today? Can you provide a list or copy of models?										
Synthesis of the current implementation	Without any distinction for displaying or printing, some labs have only 2 or 3 models, while other have 30 to 40 models.										
Effort to implement	Labs will manage their stylesheets of their model for the display or the printing and transmit them to eSanté.										
Comment	We consider that labs having more than 10 models will have more work to create these stylesheets. This assessment could be wrong because these labs may not use all their templates in the future. Besides, labs could have an interest to collaborate in the creation of these new stylesheets.										
	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	
	!	✓	!	!	✓		✓	✓	✓	!	
	Criteria x- one model ! - More than 10 models ✓- 2 to 9 models										

Requirement 38	Lab accredited ISO 15189										
Question(s)	Q2-11 Is the report in line with the ISO 15189?										
Synthesis of the current implementation	Six labs have their report in line with the ISO 15189, the others want also to fit the requirements very soon.										
Effort to implement	No impact on eSanté										
Comment	A new release of the standard is foreseen which will have more impact on informatics										
	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	
	!	!	✓	✓	✓	!	!	✓	✓	✓	
	Criteria x- Not accredited ! - In process of accreditation ✓- Accredited										

Requirement 39	Communication of the lab report with the patient by lab										
Question(s)	Q2-15 Do you also publish partial results to patients? Q2-16 Do you send different summary reports to patient and prescriber?										
Synthesis of the current implementation	Partial reports are sent to the patient only if he asks for it. The display of complete reports are the same for patient and physician, just one lab sends only the raw data to the patient.										
Effort to implement	eSanté should not send partial report to patient automatically. Labs should have the choice to produce two distinct stylesheets or to use the same for the patient and the physician.										
Comment											
	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	
	!	!	!	!	!	!	!	!	!	!	
	Criteria x- Not send to patient ! - Send on the demand of the patient ✓- Always send to the patient										

Requirement 40	Use of graphics inside the report																			
Question(s)	Q2-17 Do you sometimes insert some graphics inside your lab report?																			
Synthesis of the current implementation	Graphics are not inserted in all reports today, but they are available online. Labs would like to integrate it in their paper report.									CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	
Effort to implement	📌 Graphics could be inserted in the CDA as a picture or generated by the end user system.									✓	✓	✓	!	!	!	!	✓	✓	!	
Comment										Criteria		x- Support graphics ! - Plan to do it ✓- Do it								

5.5 Metadata associated with the lab report

Requirement 41	Ability to use metadata									
Question(s)	Q4.5-1 What are the metadata available in your LIS? (i.e. data that are not patient administrative data or the lab report itself)									
<p>Synthesis of the current implementation</p>	<p>13 of 27 Metadata suggested in the questionnaire are available in all LIS.</p> <p>Metadata that have an index of availability superior to 75% is:</p> <ul style="list-style-type: none"> • Document title [title] • Laboratory identification [authorInstitution]+B5 • Prescriber name [intendedRecipient] • Prescription ID [OrderId] • Prescription date • Other physician in copy [intendedRecipient] • Copy for the patient [intendedRecipient] • Lab test domains (e.g. Haematology, biochimie...) [typeCode] • Type of specimen (blood, urine, stools, biopsy ...) • Test done in emergency • Specimen taking date (Prélèvement) or Brought date (Apporté) • Specimen reception time (day, hour and minutes) • Comments of documents [comments] • Internal report reference [Uniqueld] • Biologist validating the lab report (name) [legalAuthenticator] • Report validation time (day, hour and minutes) • Partial result OR summary report • Abnormal biologic result classification • Language [languageCode] • Document format (e.g. CDA + xslt, PDF) [formatCode] <p>Metadata that have an index of availability between 50% and 75% is:</p> <ul style="list-style-type: none"> • Sensitive data classification [confidentialityCode] (consultation d'annonce) • Version number • Quality of the specimen (Insufficient ...) <p>Metadata that have an index of availability below 50% is:</p> <ul style="list-style-type: none"> • Author of the report [authorPerson] • Role of the author [authorRole] • Parent document ID (if exist) • Parent document relationship (addendum, replacement, etc.) 									
Effort to implement	<p> Labs have the main metadata in their LIS, nevertheless some efforts will be required in each lab to reach the 100% of availability of the metadata that will be selected nationally.</p>									
Comment	<p>Criteria</p> <p>x- Less than 49% of the Metadata are in the LIS ! - Superior to 50% of the Metadata are in the LIS ✓- Superior to 70% of the Metadata are in the LIS</p>									

Requirement 42	Metadata used in the LIS										
Question(s)	Q3-2 What are the metadata available in your LIS? (i.e. data that are not patient administrative data or the lab report itself)										
Synthesis of the current implementation	<p>According to the answer collected, two metadata datasets have been retained. The general metadata dataset is composed of data that have an index of availability superior to 75%. The additional metadata dataset is composed of data that have an index of availability between 50% and 75%.</p> <p>The general metadata dataset is:</p> <ul style="list-style-type: none"> • Internal report reference [Unique Id] • Role of the author [authorRole] • Laboratory identification [authorInstitution] • Biologist validating the lab report (name) [legalAuthenticator] • Report validation time (day, hour and minutes) • Prescriber name [intendedRecipient] • Prescription ID [OrderId] • Prescription date • Other physician in copy [intendedRecipient] • Partial result OR summary report • Lab test domains (e.g. Hematology, biochimie...) [typeCode] • Type of specimen (blood, urine, stools, biopsy ...) • Specimen taking date (Prélèvement) or Brought date (Apporté) • Specimen reception time (day, hour and minutes) <p>The additional metadata dataset is:</p> <ul style="list-style-type: none"> • Document title [title] • Author of the report [authorPerson] • Copy for the patient [intendedRecipient] • Test done in emergency • Abnormal biologic result classification • Version number • Quality of the specimen (Insufficient ...) • Comments of documents [comments] 										
Effort to implement	<p>Two datasets of metadata have been defined based on their availability in the LIS. These datasets have to be compare with the need of the platform</p>										
Comment											
	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	
	!	x	✓	!	✓	x	x	x	!	!	
	<p>Criteria</p> <p>x- Less than 49% of the Metadata are in the LIS ! - Superior to 50% of the Metadata are in the LIS ✓- Superior to 70% of the Metadata are in the LIS</p>										


Requirement 43	Standards available to exchange metadata with other internal systems										
Question(s)	Q4.5-2 If so, based on which standard(s) are metadata exchanged with other systems?										
Synthesis of the current implementation	<p>This metadata are managed by proprietary standard, nevertheless 3 LIS providers answered HL7 V2 (OUL).</p>										
Effort to implement	<p>Some efforts have to be done to be able to exchange the metadata.</p>										
Comment											
	GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka	
	✓	✓	✓	✓	!	!		✓		✓	
	<p>Criteria</p> <p>x- No exchange ! - Proprietary ✓- HL7 V2</p>										

Requirement 44	Standards used to exchange metadata with other internal systems										
Question(s)	Q3-3 Are metadata sent to other systems (Archiving, publishing, EMR...)? Q3-4 If so, based on which standard(s) are metadata exchanged with other systems?										
Synthesis of the current implementation	4 labs cannot send this metadata, 6 labs can send it. Metadata are currently exchanged with HL7 V2 message or proprietary protocol of the proprietary solution										
Effort to implement	Labs are not ready to send these metadata. HL7 V2 messages could be used to exchange these metadata with a connector.										
Comment											
	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	
	✓		✓	✗	!	!	✗	✗	✓	✗	
	Criteria ✗- No send ! - Proprietary ✓- HL7 V2										


Requirement 45	Ability to add metadata										
Question(s)	Q4.5-3 Can your system easily add metadata listed in the previous table and currently not present in the LIS.										
Synthesis of the current implementation	It depends what type of data expected.										
Effort to implement	A big effort to implement could be necessary if the model of the database has to be changed.										
Comment											
	GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka	
	!	!	!	!	✓	✓		✗		✓	
	Criteria ✗- No ! - It depend ✓- Yes										


Requirement 46	Ability to add external identifier for document										
Question(s)	Q4.5-4 Is the LIS able to add external identifiers for documents (e.g. a global unique document id)?										
Synthesis of the current implementation	Generally it is feasible.										
Effort to implement	No big effort to implement										
Comment	Data provider should provide a unique document ID such as an OID.										
	GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka	
	✓	✓	✓	✓	✓	✓		✓		✗	
	Criteria ✗- No ! - ✓- Yes										


Requirement 47	Data used by labs to retrieve a lab result										
Question(s)	Q3-1 What are the research parameters in your system? (What are data used to retrieve a lab result?)										
Synthesis of the current implementation	Parameters generally offered to physicians to retrieve a test are: • Patient identification information: Name, address, matricule • Test types group or individual analysis • Internal code ID • Prescripteur • Order date, result date										
General effort to implement the requirement	These parameters have to be inside the submission set and the header of the national CDA template to enable the finding of a specific report.										
Comment											
	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK	
	Criteria No assessment										

Requirement 48	Identification used for the receiver (prescriber)																																	
Question(s)	Q3-5 How the receivers (e.g. prescribers) are identified for electronic communication?																																	
Synthesis of the current implementation	Receivers are identified with their CNS code, their name and with an internal number. CRL uses another ID (3 first letter of the name + a number between 0-9), but do not send any data to prescriber.	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK																							
Effort to implement		 <p>eSanté could deal with the CNS code in the first phase, but the CNS code has several limits. The CNS code is no unique in time and can be given to another physician. One physician can have many CNS code or one code can cover many physicians. Some rules for the identification of a foreign prescriber have to be created.</p>	<table border="1"> <thead> <tr> <th data-bbox="1109 416 1141 495">Criteria</th> <th data-bbox="1141 416 1173 495">CHL</th> <th data-bbox="1173 416 1204 495">LNS</th> <th data-bbox="1204 416 1236 495">KT</th> <th data-bbox="1236 416 1268 495">LR</th> <th data-bbox="1268 416 1300 495">CHDN</th> <th data-bbox="1300 416 1332 495">FS</th> <th data-bbox="1332 416 1364 495">CRL</th> <th data-bbox="1364 416 1396 495">CHEM</th> <th data-bbox="1396 416 1428 495">FFE</th> <th data-bbox="1428 416 1460 495">ZK</th> </tr> </thead> <tbody> <tr> <td data-bbox="1109 495 1141 607"></td> <td data-bbox="1141 495 1173 607">✓</td> <td data-bbox="1173 495 1204 607"></td> <td data-bbox="1204 495 1236 607">✓</td> <td data-bbox="1236 495 1268 607">✓</td> <td data-bbox="1268 495 1300 607">✓</td> <td data-bbox="1300 495 1332 607">✓</td> <td data-bbox="1332 495 1364 607">!</td> <td data-bbox="1364 495 1396 607">✓</td> <td data-bbox="1396 495 1428 607">✓</td> <td data-bbox="1428 495 1460 607">✓</td> </tr> </tbody> </table> <p>x- No identification ! - Internal ID ✓- CNS code</p>											Criteria	CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK		✓		✓	✓	✓	✓	!	✓	✓
Criteria	CHL													LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK												
	✓		✓	✓	✓	✓	!	✓	✓	✓																								
Comment																																		

5.6 User authentication

Requirement 49	Support of external system for authentication									
Question(s)	Q 4.6-1 Does your system support linking with external systems for authentication and for some kind of Single-Sign-On?									
Synthesis of the current implementation	<p>All LIS examined support an external system for the authentication, but they use all different systems. Cegeka supports Kerberos. MIPS supports LDAP. OSM could support LDAP. FS supports a link to an external database. CHdN uses Siemens ID center for authentication.</p>									
Effort to implement	 No implementation asked									
Comment										
	GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
	✓	✓	✓	✓	✓	✓		✓		✓
	Criteria <ul style="list-style-type: none"> x- No ! - ✓- Yes 									

Requirement 50	Support of authentication mean									
Question(s)	Q 4.6-2 Which kind of user authentication does your system support?									
Synthesis of the current implementation	<p>4 support Username and Password 1 supports Smartcard (using X.509 certificates) 1 supports Biometrical (e.g., Fingerprint) 1 supports the CPS card in France 1 supports RFID</p>									
Effort to implement	 No implementation asked									
Comment										
	GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
	✓	✓	✓	✓	✓	!		✓		✓
	Criteria <ul style="list-style-type: none"> x- No authentication mean ! - Username and password ✓- Card or fingerprint 									

Requirement 51	Support of IHE ATNA, EUA and XUA									
Question(s)	Q 4.6-3 Does your system support the IHE – Audit Trail and Node Authentication profile (ATNA) and which actors and options are supported? Q 4.6-4 Does your system support the IHE – Enterprise User Authentication (EUA) profile for centralized user authentication management? Q 4.6-5 Does your system support the IHE – Cross Enterprise User Assertion integration (XUA) profile to communicate claims about authenticated principals for cross enterprise transactions?									
Synthesis of the current implementation	None of the LIS provider implemented these IHE profiles									
Effort to implement	 No implementation asked									
Comment										
	GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
	x	x	x	x	x	x		x		x
	Criteria <ul style="list-style-type: none"> x- No support of these profiles ! - ✓- Support at least one of these profiles 									

5.7 Electronic signature

Requirement 52	Support of a qualified electronic signature															
Question(s)	Q 4.7-1 Does your system support the qualified electronic signature of medical documents, reports, images? Q 4.7-2 Which kind of certificates are supported for this electronic signature? Q 4.7-3 Which kind of medium is supported for the storage of the signature key? Q 4.7-5 Is the LIS able to support bulk signing process (sign automatically a set of reports)? Q 4.7-6 How is the electronic signature linked to the document?															
Synthesis of the current implementation	Only FS supports the electronic signature with X.509 certificate. Key-Files are encrypted using a master-password and stored in a database. FS and OSM support bulk signing process and the signature of the document is embedded with the document (attached).						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							X	X	X	X	X	✓		!		X
Effort to implement	A strong effort has to be provided by LIS provider						Criteria x- No support electronic signature ! - In development process ✓- Support electronic signature									
Comment																

Requirement 53	Integration of the signature in the workflow															
Question(s)	Q 4.7-4 How is the electronic signature process being integrated in the workflow?															
Synthesis of the current implementation	All LIS providers answered that signature process is done or should be done using the institutional signature.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							✓	✓	✓	✓	✓	✓		✓		✓
Effort to implement	A strong effort has to be provided by LIS provider to integrate the electronic signature process in the workflow						Criteria x- Biologist electronic signature ! - ✓- Institutional electronic signature									
Comment																

Requirement 54	Document supported by the electronic signature															
Question(s)	Q 4.7-7 Which document format can be electronically signed by the LIS?															
Synthesis of the current implementation	FS can sign PDF and HealthNet XML file. OSM can sign PDF only MIPS plan to integrate the signature of PDF in the version 3.8 with an encryption key for the target.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							X	X	X	X		✓		!		X
Effort to implement	A huge effort has to be done by LIS provider to add a signature functionality						Criteria x- No signature supported ! - Sign PDF ✓- Sign all files									
Comment																


Requirement 55	Support of XAdES or IHE DSG															
Question(s)	Q 4.7-8 Does your system support the IHE Document Digital Signature Content profile (DSG) for digital signatures of documents that are shared between organizations? Q 4.7-9 Does your software support the XML Advanced Electronic Signature (XAdES) standard for signature creation?															
Synthesis of the current implementation	Neither IHE DSG or XAdES is supporter by the LIS provider						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							X	X	X	X	X	X		X		X
Effort to implement	A huge effort has to be done by LIS provider to add a signature functionality						Criteria x- No support ! - ✓- Support									
Comment																

5.8 Miscellaneous

Requirement 56	Ability to integrate of a PKI															
Question(s)	Q 4.8-1 Is your system configurable to integrate with an existing Public Key - Infrastructure?															
Synthesis of the current implementation	Only the CHdN is able to integrate an existing PKI						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							X	X	X	X	✓			X		X
Effort to implement							Criteria									
Comment	The CHdN is working on his own PKI system.						x- No ! - ✓- Yes									

Requirement 57	Support of IHE ILW															
Question(s)	Q 4.8-3 Does your LIS support the Inter-Laboratory Workflow (ILW) profile of IHE for laboratory subcontracting?															
Synthesis of the current implementation	Cegeka supports the ILW main profile without its supplementary options.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							X	X	X	X	X	X				!
Effort to implement	Subcontracting is not covered by the platform.						Criteria									
Comment							x- No support ! - Support without option ✓- Full support									

Requirement 58	Support of the subcontracting workflow															
Question(s)	Q 4.8-2 Is inter-laboratory subcontracting supported by the software? Q 4.8-4 Is your LIS able to integrate results from a partial report from subcontractor in a complete report?															
Synthesis of the current implementation	Subcontracting is managed by lab2lab communication with HPRIM Image, LDT or HL7 ML and OUL. The integration of the result of the subcontractor in the report is managed at least by a PDF attachment or by an import of the result as for an instrument.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
							✓	✓	✓	✓	!	X		✓		✓
Effort to implement	Subcontracting is not covered by the platform.						Criteria									
Comment	Everybody uses his own protocol, it is point to point mapping.						x- No ! - PDF attachment ✓- Point to point mapping									

Requirement 59	Subcontracting lab behaviour															
Question(s)	Q2-18 Does your laboratory subcontract tests with other countries? Q2-19 If there is subcontracting, which lab is responsible for publishing the report?															
Synthesis of the current implementation	Labs use subcontracting with many countries for various domains, mostly for the biochemistry domain. The main countries are the France, Belgium and Germany. Switzerland, Austria, Holland, GB and USA are also cited. In practice, it is not clear which lab is responsible for publishing the result of the subcontractor.						CHL	LNS	KT	LR	CHDN	FS	CRL	CHEM	FFE	ZK
							X	✓	X	!	X	X		✓	✓	X
Effort to implement	 eSanté has to manage foreign lab reports (certainly in PDF). The new law (loi de 1984 modifiée en janvier 2011) defines that the lab that takes the specimen is responsible for all the process and so it will be responsible to send all reports to the platform.						Criteria									
Comment							x- The subcontracting lab is responsible ! - Both ✓- The lab that take the sample is responsible									

Requirement 60	LIS provider project reference															
Question(s)	Q 4.8-5 Could you provide us a list of your reference projects which uses XDS / XD-LAB with contact of the customer? And if possible some outcomes like ROI?															
Synthesis of the current implementation	According to MIPS, no projects are using XDS / XD-LAB in production. All projects like ELGA, DMP in relation to laboratory results are base on potential interest but not financed and therefore to our knowledge not deployed.						GLIMS	GLIMS	GLIMS	GLIMS	CHdN	FS	MAGIC	OSM	GNT	Cegeka
Effort to implement							X	X	X	X	X	X	X	X	X	X
Comment							Criteria		x- No reference ! - ✓- Reference in one project with IHE XD LAB							

6. List of Questions for Lab

Patient Identification

Q1-1 Which patient identifier is used inside the LIS?

Q1-2 How are identified EU agents and foreigner patients without matricule?

Q1-3 How do you manage the patient identification with subcontractor?

Q1-4 Which components of patient identification data can you provide?

Q1-5 Which standard(s) is (are) used to transmit these identifying data from the HIS to the LIS?

Q1-6 How do you manage the identification of a person who cannot be identified (e.g. in emergencies, analysis under "X", VIP ...)?

Q1-7 If you use temporary patient IDs do you have a means to distinguish them from definite IDs?

Q1-8 How do you distinguish unidentified data (e.g. in emergencies, analysis under "X", VIP ...) from identified data?

Q1-9 Are there unique patient identifiers in the HIS/LIS, which do not correspond to physical persons (e.g. analyses for animals, tests patient IDs etc.)?

Q1-10 If these identifiers are distinguishable from normal patient IDs, how do you distinguish them?

Q1-11 In which system is the merging of two patient identities done?

Q1-12 If you merge the patient ID, which communication protocol do you use?

Q1-13 How is the updating/changing of patient identifying demographic data handled between the connected systems?

Q1-14 If you handle the update of administrative data, which communication protocol do you use?

Laboratory report

Q2-1 Which domain do you cover and for which domain do you send lab results electronically?

Q2-2 Where is stored the report?

Q2-3 Do you send partial lab results to the prescriber?

Q2-4 How are partial results and summary reports distinguished?

Q2-5 Are published partial reports updated? And if so, how?

Q2-6 Are published summary reports updated? And if so, how?

Q2-7 Is your lab report structured?

Q2-8 If yes, what is the content structure of your lab report?

Q2-9 How many templates of reports do you manage today? Can you provide a list or copy of templates?

Q2-10 Does your laboratory create cumulative reports with anteriority of different encounters with the patient?

Q2-11 Is the report in line with the ISO 15189?

Q2-12 What is the system of codes used today to express the measurement units inside a report?

Q2-13 Based on which standard(s) are lab reports exchanged between the LIS and other internal systems (publishing, archiving, administrative...)?

Q2-14 If you communicate your lab report electronically, what standard(s) do you use?

Q2-15 Do you also publish partial results to patients?

Q2-16 Do you send different summary reports to patient and prescriber?

Q2-17 Do you sometimes insert some graphics inside your lab report?

Q2-18 Does your laboratory subcontract tests with other countries?

If yes, which domains are you subcontracting and with which country?

Q2-19 If there is subcontracting, which lab is responsible for publishing the report?

Metadata associated with the lab report

Q3-1 What are the research parameters in your system? (What are data used to retrieve a lab result?)

Q3-2 What are the metadata available in your LIS? (i.e. data that are not patient administrative data or the lab report itself)

Q3-3 Are metadata sent to other systems (Archiving, publishing, EMR...)?

Q3-4 If so, based on which standard(s) are metadata exchanged with other systems?

Q3-5 How the receivers (e.g. prescribers) are identified for electronic communication?

7. List of Questions for LIS Provider

- Q 4.2-1 Is your LIS System a standalone solution or is it a part of another information system (e.g., HIS)?
- Q 4.2-2 Which standard protocols (e.g., HL7) for communication / integration are supported by your applications?
- Q 4.2-3 Have you joined with your software the IHE Connectathon for testing the connectivity with other systems. If yes, could you provide the Integration Statement document for the software version where this questionnaire relates to?
- Q 4.2-4 Do you plan to implement additional IHE profiles and if so which and when?
- Q 4.3-1 Does your system support the sharing (sending/receiving) of patient demographic data with other systems (e.g. HIS)?
- Q 4.3-2 Does your system support the IHE – Patient Administration Management (PAM) profile and if so, which actors and options?
- Q 4.3-3 Does your system support the IHE – Patient Demographics Query (PDQ) profile for sharing patient demographic and encounter data and if so, which actors and options?
- Q 4.3-4 Is your system able to use unique patient identifiers from other systems, e.g., an MPI system of an institution, and if so how?
- Q 4.3-5 Does your system support further information features to stronger identify patients, for example biometrical data?
- Q 4.4-1 Does your system support the IHE Cross-Enterprise Document Sharing (XDS or XDS.b) profile and which actors?
- Q 4.4-2 Does your system support the IHE Sharing Laboratory Reports (XD-LAB) profile and which actors?
- Q 4.4-3 Based on which standard(s) are lab reports exchanged between the LIS and other systems (publishing, archiving, administrative...)?
- Q 4.4-4 Which formats for reports does your system support (e.g., CDA, PDF)?
- Q 4.4-5 If CDA is supported, how flexible is the software to configure the export of CDA documents based on national templates?
- Q 4.4-6 Is LOINC codification directly supported, or can your internal codification be mapped to a national LOINC codification?
- Q 4.4-7 How does your software manage the update of the codification?
- Q 4.4-8 Does your system support the Laboratory Code Set Distribution (LCSD) integration profile?
- Q 4.4-9 How are partial results and complete reports distinguished?
- Q 4.4-10 Are published partial reports updated? And if so, how?
- Q 4.4-11 Are published complete reports updated? And if so, how?
- Q 4.4-12 Are the LIS able to create cumulative reports with anteriority of different encounters with the patient and if so is the LIS able to transmit it as a document?
- Q 4.4-13 What is the system of codes used today to express the measurement units inside a report?
- Q 4.4-14 Is your LIS able to convert measurement units?
- Q 4.5-1 What are the metadata available in the LIS? (i.e. data that are not patient administrative data or the lab report itself)
- Q 4.5-2 If so, based on which standard(s) are metadata exchanged with other systems?
- Q 4.5-3 Can your system easily add metadata listed in the previous table and currently not present in the LIS.
- Q 4.5-4 Is the LIS able to add external identifiers for documents (e.g. a global unique document id)?
- Q 4.6-1 Does your system support linking with external systems for authentication and for some kind of Single-Sign-On?
- Q 4.6-2 Which kind of user authentication does your system support?
- Q 4.6-3 Does your system support the IHE – Audit Trail and Node Authentication profile (ATNA) and which actors and options are supported?
- Q 4.6-4 Does your system support the IHE – Enterprise User Authentication (EUA) profile for centralized user authentication management?
- Q 4.6-5 Does your system support the IHE – Cross Enterprise User Assertion integration (XUA) profile to communicate claims about authenticated principals for cross enterprise transactions?
- Q 4.7-1 Does your system support the qualified electronic signature of medical documents, reports, images?
- Q 4.7-2 Which kind of certificates are supported for this electronic signature?
- Q 4.7-3 Which kind of medium is supported for the storage of the signature key?
- Q 4.7-4 How is the electronic signature process being integrated in the workflow?
- Q 4.7-5 Is the LIS able to support bulk signing process (sign automatically a set of reports)?
- Q 4.7-6 How is the electronic signature linked to the document?
- Q 4.7-7 Which document format can be electronically signed by the LIS?

Q 4.7-8 Does your system support the IHE Document Digital Signature Content profile (DSG) for digital signatures of documents that are shared between organizations?

Q 4.7-9 Does your software support the XML Advanced Electronic Signature (XAdES) standard for signature creation?

Q 4.8-1 Is your system configurable to integrate with an existing Public Key - Infrastructure?

Q 4.8-2 Is inter-laboratory subcontracting supported by the software?

Q 4.8-3 Does your LIS support the Inter-Laboratory Workflow (ILW) profile of IHE for laboratory subcontracting?

Q 4.8-4 Is your LIS able to integrate results from a partial report from subcontractor in a complete report?

Q 4.8-5 Could you provide us a list of your reference projects which uses XDS / XD-LAB with contact of the customer?

And if possible some outcomes like ROI?

8. Reference contacts

Person who answers the questionnaire for the lab

	Family name	First name	Function	Email	Phone
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ZK - Zitha klinik	MICHELS	Jean-Marc	Responsable-adjoint du Laboratoire Clinique	jean-marc.michels@cst.lu	49 776-4574

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