

# ANTILOPE Handover workshop

*Franck Le Gall, Easy Global Market*  
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**FIWARE**  
OPEN APIs FOR OPEN MINDS

# Understanding FIWARE

(Open Standard Platform)

(Advanced OpenStack-based Cloud + rich library of Enablers)

**FIWARE**  
OPEN APIs FOR OPEN MINDS

**EASY HARD**

Driven by implementation

Sustainability ensured

**Yes WE'RE OPEN**

**THE INTERNET OF THINGS**

**BIG DATA**

Unstructured data, Semi-structured data, Useful Metadata, Structured data, Concept, Text

www.comsoc.org/blog

# FIWARE Generic Enablers (GEs)

- A FIWARE Generic Enabler (GE):
  - set of general-purpose **platform functions** available through **APIs**
  - Building with other GEs a [FIWARE Reference Architecture](#)
- [FIWARE GE Specifications](#) are open (public and royalty-free)
- **FIWARE GE implementation (FIWARE GEi):**
  - Platform product that implements a given GE Open Spec
  - There might be multiple compliant GEis of each GE Open Spec
- **One open source reference implementation** of each FIWARE GE (**FIWARE GERi**):
  - Well-known open source license
  - Publicly available [Technical Roadmap](#) updated in every release
- Available FIWARE GEis, GERis and incubated enablers are published on the [FIWARE Catalogue](#) <sup>3</sup>











# FIWARE enablers ecosystem features

36 Generic enablers



And Specific enablers

Cloud		<ul style="list-style-type: none"> <li>• Federation of infrastructures (private/public regions)</li> <li>• Automated GE deployment</li> </ul>
Data/Services Delivery		<ul style="list-style-type: none"> <li>• Complete Context Management Platform</li> <li>• Integration of Data and Media Content</li> </ul>
IoT		<ul style="list-style-type: none"> <li>• Easy plug&amp;play of devices using multiple protocols</li> <li>• Automated Measurements/Action - Context updates</li> </ul>
Apps		<ul style="list-style-type: none"> <li>• Visualization of data (operation dashboards)</li> <li>• Publication of data sets/services</li> </ul>
Web UI		<ul style="list-style-type: none"> <li>• Easy incorporation of advanced 3D and AR features</li> <li>• Visual representation of context information</li> </ul>
Security		<ul style="list-style-type: none"> <li>• Security Monitoring</li> <li>• Built-in Identity/Access/Privacy Management</li> </ul>
I2ND		<ul style="list-style-type: none"> <li>• Advanced networking (SDN) and middleware</li> <li>• Interface to robots</li> </ul>
<b>FISTAR</b>		<ul style="list-style-type: none"> <li>• Health specific enablers</li> <li>• Data to applications paradigm</li> </ul>

**7 Use cases**

**Interoperability profiles**

### Leeds, UK

2-D bar-coding for real time reverse medication supply chain



### Tromsø, Norway

Tele-health network for Diabetes patients



### Munich, Germany

Virtualization of operating theatre environments and real time data integration for monitoring and reduction of errors



### Krakow, Poland

Interactive online facilities for access and quality of care



### Bilbao, Spain

New Interactive Future Internet based services for people with Mental Health problems



### Bucharest, Romania

Online Cardiology service for people with heart failure

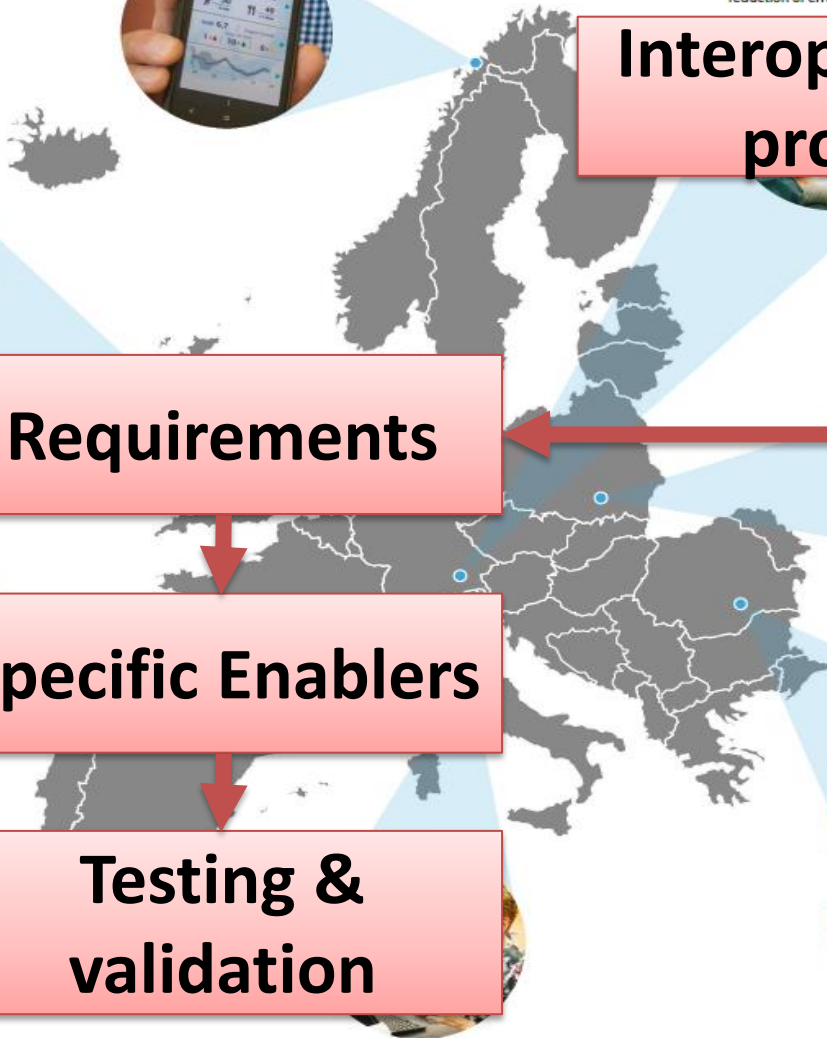
### Bologna, Italy

Provision of a network capable to connect different applications and devices

**Requirements**

**Specific Enablers**

**Testing & validation**



*PeAA Personnel Assistant Application*



Laptop  
Os:Linux  
With Apache Tomcat 7

**BACKEND**  
FRONTEND



WI-Fi



Pulxiossimeter Nonin Onyx II



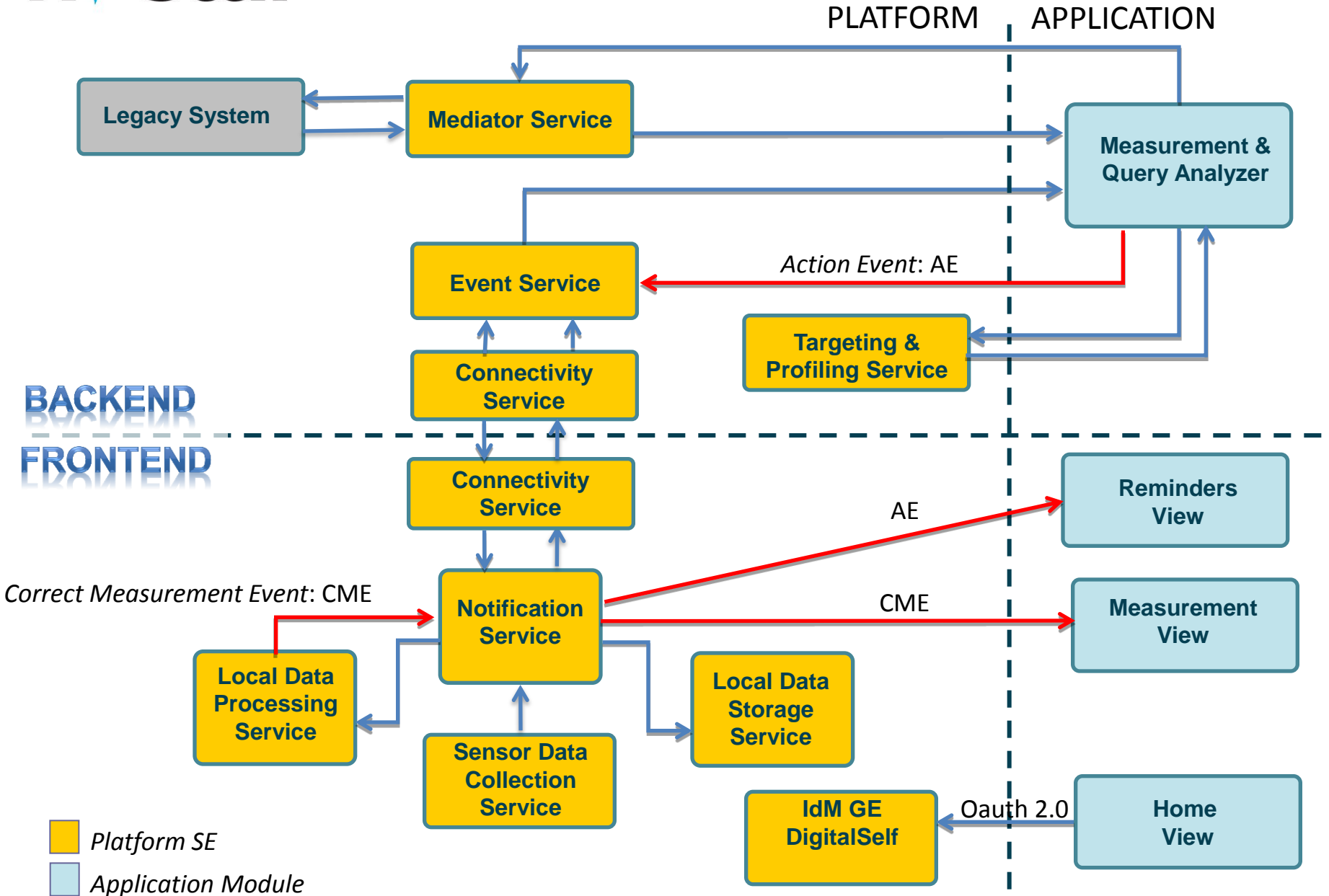
Bluetooth HDP profile

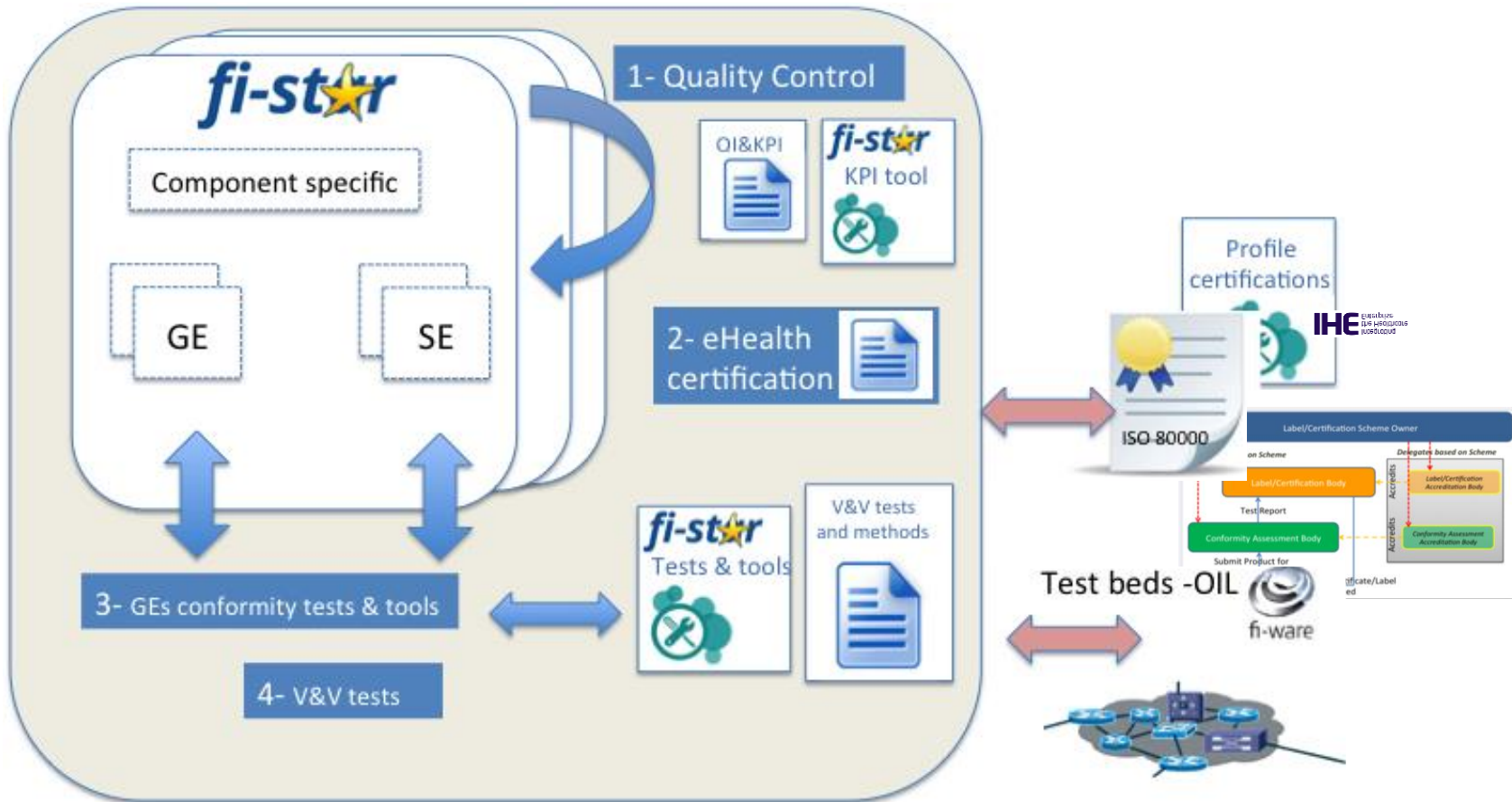


Tablet / Smartphone  
With android > 4.0

*PAA Patient Assistant Application*



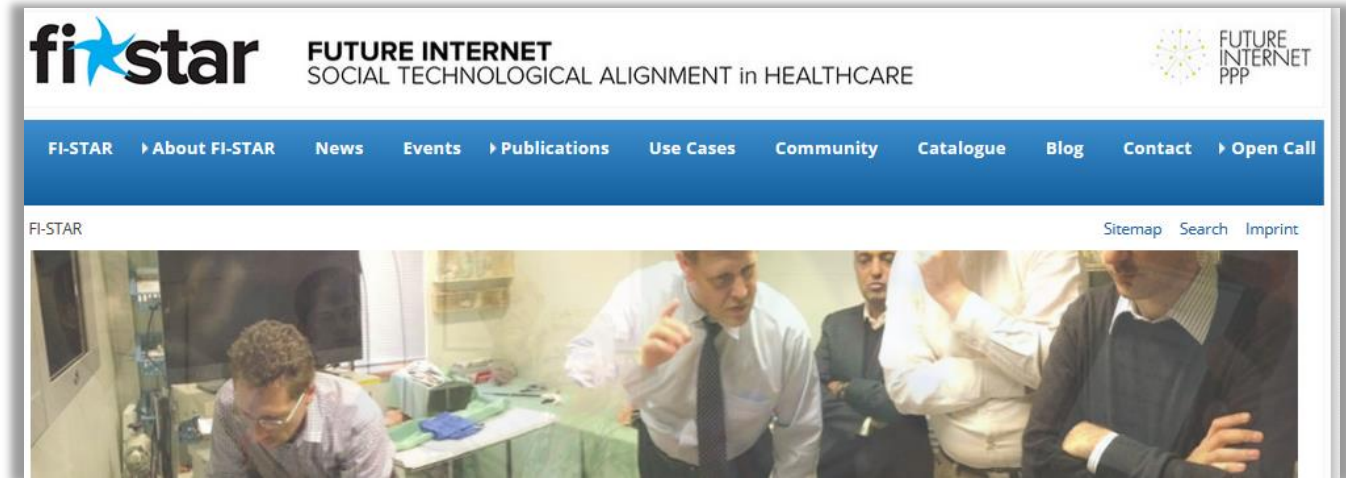








# Want to know more?



[www.fi-star.eu](http://www.fi-star.eu)



[www.fi-ware.org](http://www.fi-ware.org)

FI-STAR/IHE-Europe introduction

Future Internet Social and Technological  
Alignment Research (FI-STAR)

# Electronic Health Record Application Support Service Enablers (EHR-EN)

Partners: University of Cyprus & InfoTEX Software Solutions Ltd

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# **EHR-EN covers 3 SEs**

- epSOS SE
- EHR SE
- PACS SE

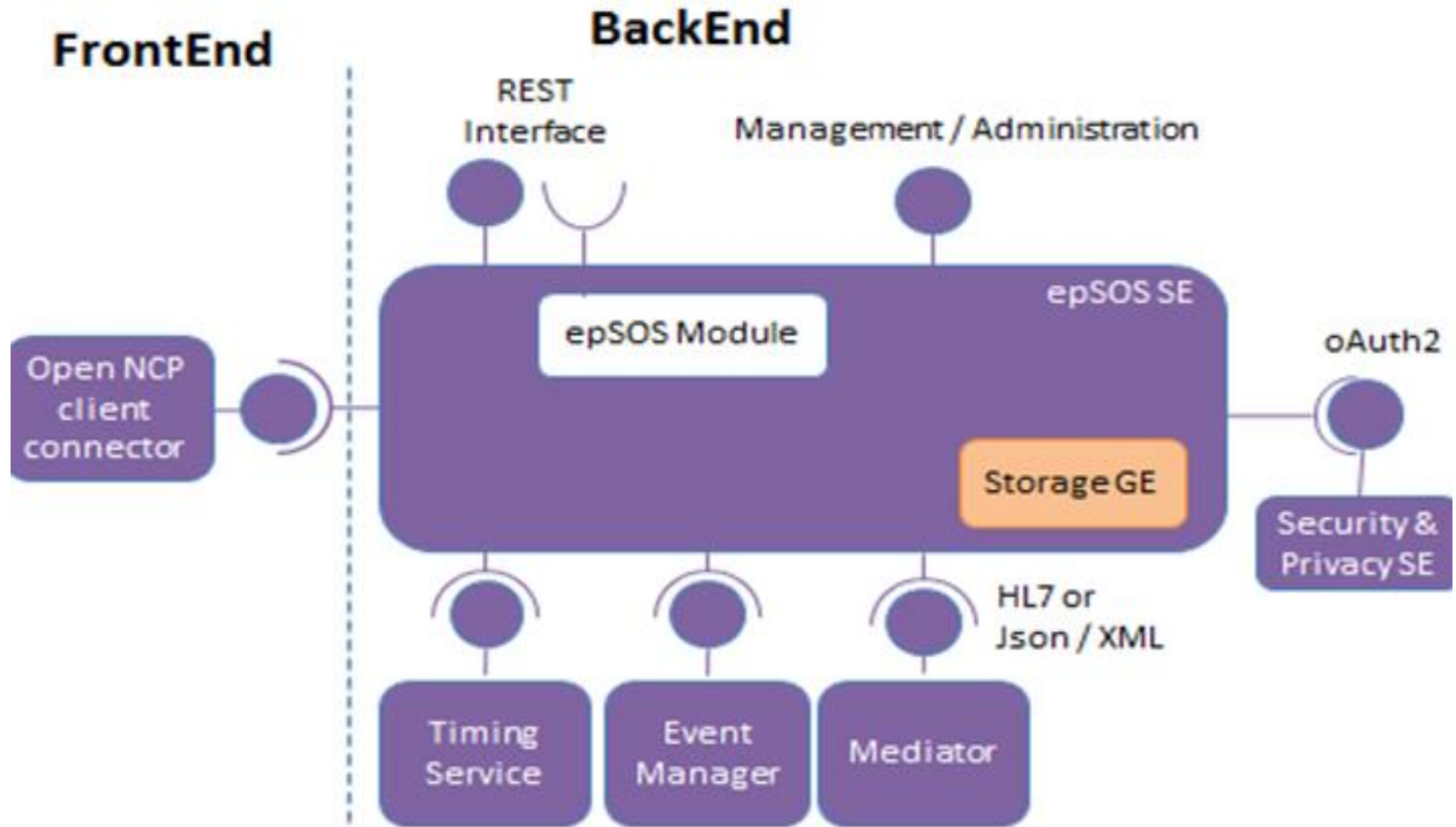
# epSOS SE

The epSOS SE BACK-END API:

- Covers the exchange of the patient summary data between countries.
- Includes the basic and extended patient summary (PS) data-sets as indicated by the epSOS LSP (<http://www.epsos.eu/>).
- Offers the functionality to develop: **(1) the client site** and **(2) the client connector** to a local National Contact Point portal as it is defined by the epSOS Large Scale Pilot (LSP) and following the recommendations and guidelines offered by the OpenNCP platform (<https://openncp.atlassian.net/wiki/display/ncp/OpenNCP+Community+Home>).



# epSOS SE Internal Connectivity



M-HEALTH E-EMERGENCY SYSTEMS



FOR MEDICAL IMAGE ANALYSIS SYSTEMS:  
ULTRASOUND, ENDOSCOPY, MICROSCOPY

SC

# EHR SE

The EHR SE BACK-END API:

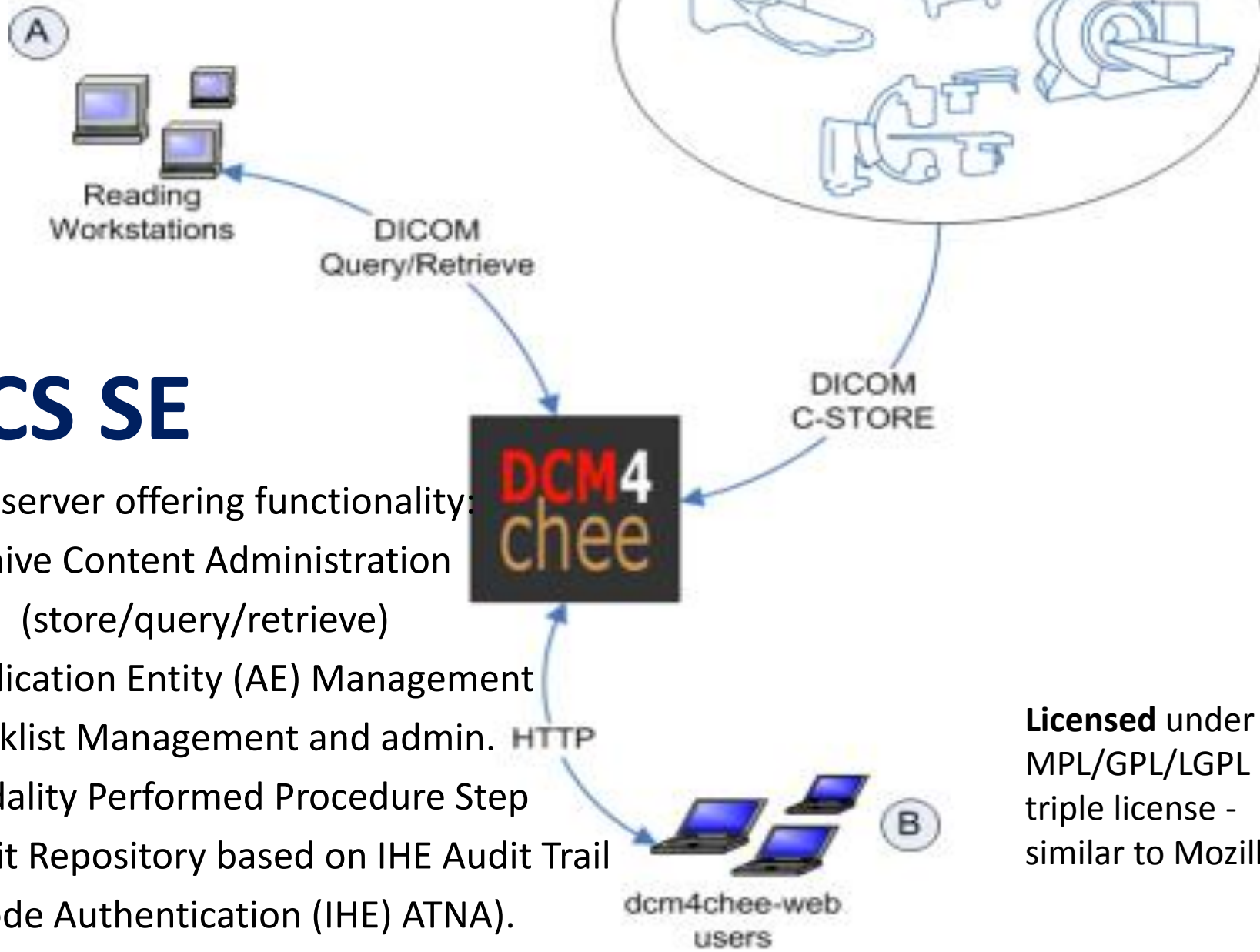
- **Will be linked with the epSOS SE and the PACS SE.**
- The related protocols, standards and technologies used in the implementation are in agreement with the epSOS large scale pilot.
- The EHR SE will support the electronic patient record and will be able to support the patient summary, both the **basic and the extended versions**, based on the epSOS SE and the imaging module based on the PACS SE.
- The EHR documents to be exchanged will be defined by adopting HL7 CDA V2.0 with reference to IHE PCC by adopting IHE X\* profiles.







# dcm4che.org



## PACS SE

DICOM server offering functionality:

- Archive Content Administration (store/query/retrieve)
- Application Entity (AE) Management
- Worklist Management and admin.
- Modality Performed Procedure Step
- Audit Repository based on IHE Audit Trail and Node Authentication (IHE) ATNA).

**Licensed** under an MPL/GPL/LGPL triple license - similar to Mozilla

localhost:8080/dcm4chee-web3/ticketinterface.html

Most Visited Getting Started Toshiba Google Translate

Folder Trash Application

Search

Phonetic
   
 Modality 
  
 Exact search

Latest studies first

Pagesize: 10 Study 1 to 4 of 4

Show column titles

1	Patient Name	Patie
2	Study Date/Time	Stud
3	FELIX	7DFD
3	4/22/2005 11:49	4450
3	4/22/2005 11:49	
3	4/22/2005 12:27	17
3	4/22/2005 12:27	1
3	4/22/2005 12:27	2
3	4/22/2005 12:27	3
3	4/22/2005 12:27	4
3	4/22/2005 12:28	5

Series 1 to 4 of 4

Series Date: 4/22/2005 12:27 Description: Shared\_echo\_Cor\_bh\_SUB\_MIP\_COR Modality: MR Instance 1 bis 10

1 2 3 4 5

6 7 8 9 10

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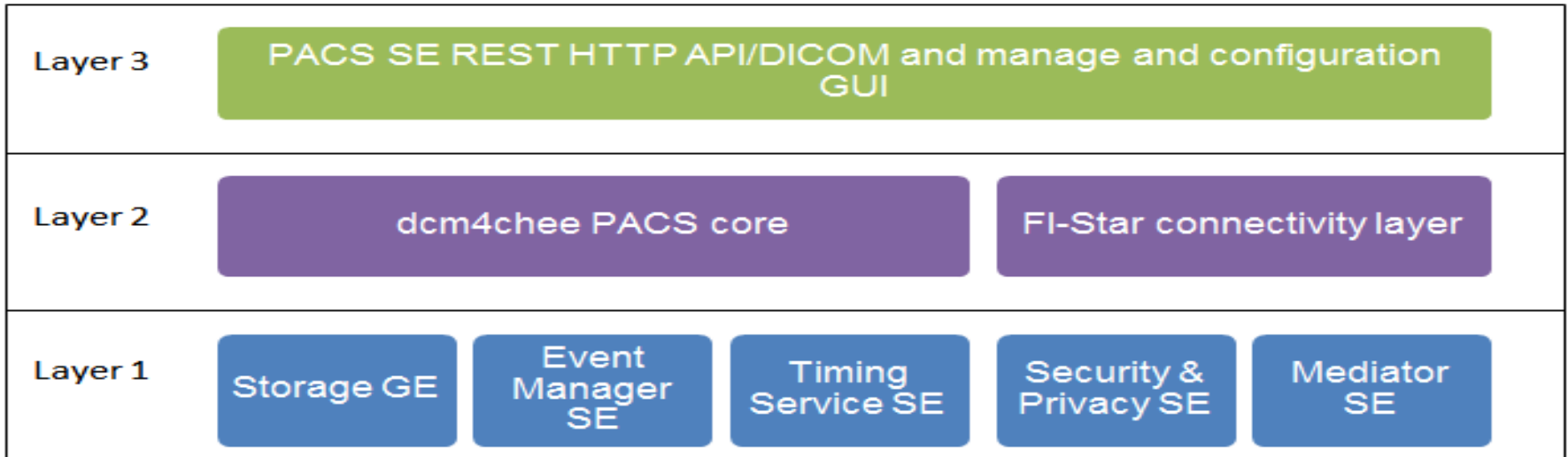
Choose One [dcm4chee.org](http://dcm4chee.org)

Accession No:

#5/#1 Availability

4/369	ONLINE	<input type="button" value="Print"/>	<input type="button" value="Download"/>	<input type="button" value="Refresh"/>	<input type="button" value="Close"/>
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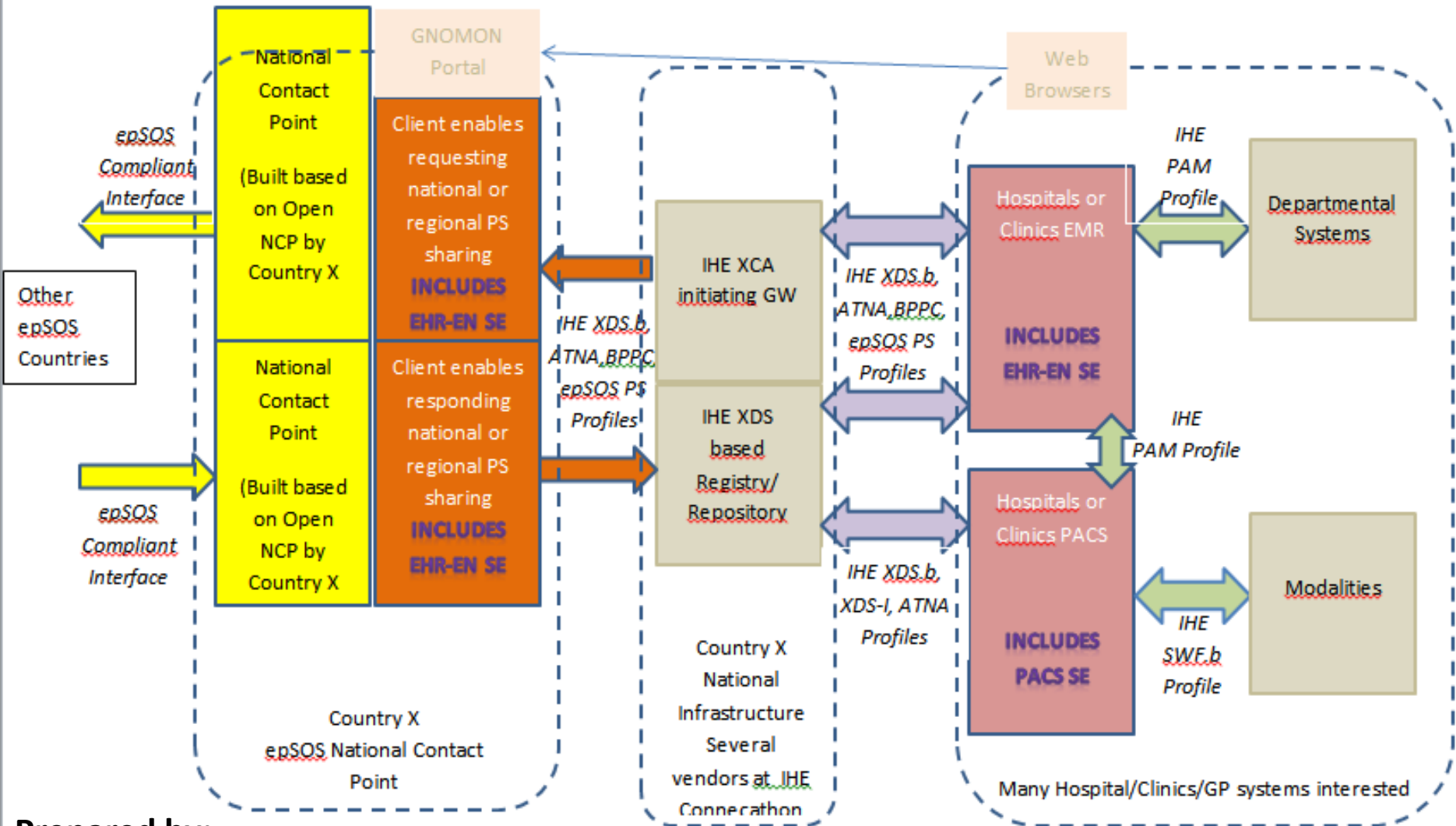
# PACS SE Internal Connectivity



- Layer 1 contains FI-STAR SE infrastructure (Storage SE, Event Manager SE, Timing Service SE, Security & Privacy SE and Mediator SE).
- Layer 2 covers the FI-STAR connectivity layer and dcm4chee core. Dcm4cheewill contain the following components : Archive content administration, Application entity management, MPPS manager, MWL manager, ATNA audit repository, IAN/SCN service.
- Layer 3 implements the connection to the application level providing the functionality and services of layer 2. It will support REST HTTP API and DICOM protocol functionality.



# EHR EN Networking Configuration



Prepared by:  
Charles Parisot (GE & IHE)





Imaging Repository

Image Retrieve  
(Wado, DICOM, ITI-49)

Image Repository

OpenPDQ

Patient-Id Supplier

EHR

PACS

PDQ Query

Use VM Machine  
from NIST

XDS Doc Registry  
XDS Repository

Pt Summary Document  
(epSOS summary CDA)

XDS-I Imaging Source & Consumer  
- DCMforCHE V3 → read:write Imaging Study Manifest document (incl image links)

XDS Provide & register

**OHT IHE Profiles**

PDQ Consumer (PIX Consumer)  
XDS Doc Source  
XDS Doc Consumer  
ATNA Client  
CT Client

XDS Query

XDS Retrieve

OpenATNA

Audit Repository

Audit Event



IHE Integration Statement			
Vendor	Product Name	Version	Date
University of Cyprus	EHR SE	v.1	1/12/15

This product implements all transactions required in the IHE Technical Framework to support the IHE Integration Profiles, Actors and Options listed below :

Integration Profile	Actor	Integration Profile Option
Audit Trail and Node Authentication	Audit Record Repository	None
Audit Trail and Node Authentication	Secure Node	None
Consistent Time	Time Client	None
epSOS Patient Summary Document	Content Consumer	None
epSOS Patient Summary Document	Content Creator	None
Patient Demographic Query HL7 V3	Patient Demographics Consumer	None
Cross-Enterprise Document Sharing	Document Consumer	None
Cross-Enterprise Document Sharing	Document Source	None
Cross-Enterprise Document Sharing for Imaging	Imaging Document Consumer	None
Cross-Enterprise Document Sharing for Imaging	Imaging Document Source	None
Cross-Enterprise Document Sharing for Imaging	Imaging Document Source	CDA Imaging Report with Structured Headings

Internet address for vendors IHE information : <http://www.ucy.ac.cy>

Links to Standards Conformance Statements for the Implementation

<b>HL7</b>	
<b>DICOM</b>	

*Thank You*  
*Σας Ευχαριστώ*