

# What is a CDR?

Ian McNicoll



Co-chair openEHR Foundation  
freshEHR Clinical Informatics Ltd.



August 2016

# Introduction

## Dr Ian McNicoll

- Clinician
  - Former Glasgow GP
- Health informatician
  - Co-chair openEHR Foundation
  - Director freshEHR Clinical Informatics
- Commercial software developer
  - 'Clinical hacker'



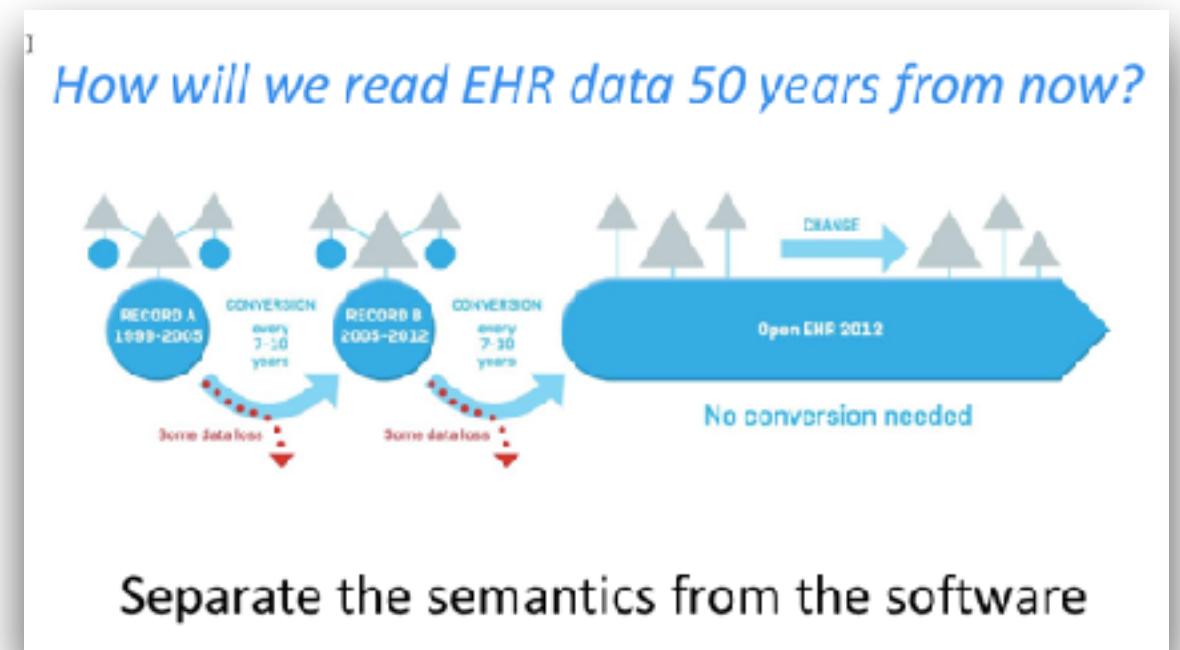
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openEHR

# openEHR - key goal

- Provide open specifications for an eHealth platform
- keeping the data in any openEHR system completely interoperable
  - regardless of programming language
  - regardless of human language
  - regardless of internal database technology





Home

Programs

Getting Involved

Tools

News & Events

What is openEHR?

Who is using openEHR?

Specifications

UML

XSD

Clinical Models

CKM



Software



## Membership

Become an openEHR member!

How does openEHR membership work?

Membership sign-up page

Industry Partners



## Tweets



ebot70

@ebot70

6h

Top hashtags for  
@CaboLabs: #openehr  
#cabolabs #medinfo2015

## Industry News

Ocean rises to target PHNs and integrated care market  
September 17, 2015

New open source tools available for openEHR archetype development  
September 15, 2015

## Community News

Slovenia builds Arthroplasty register on OpenEHR  
December 22, 2015

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December 22, 2015

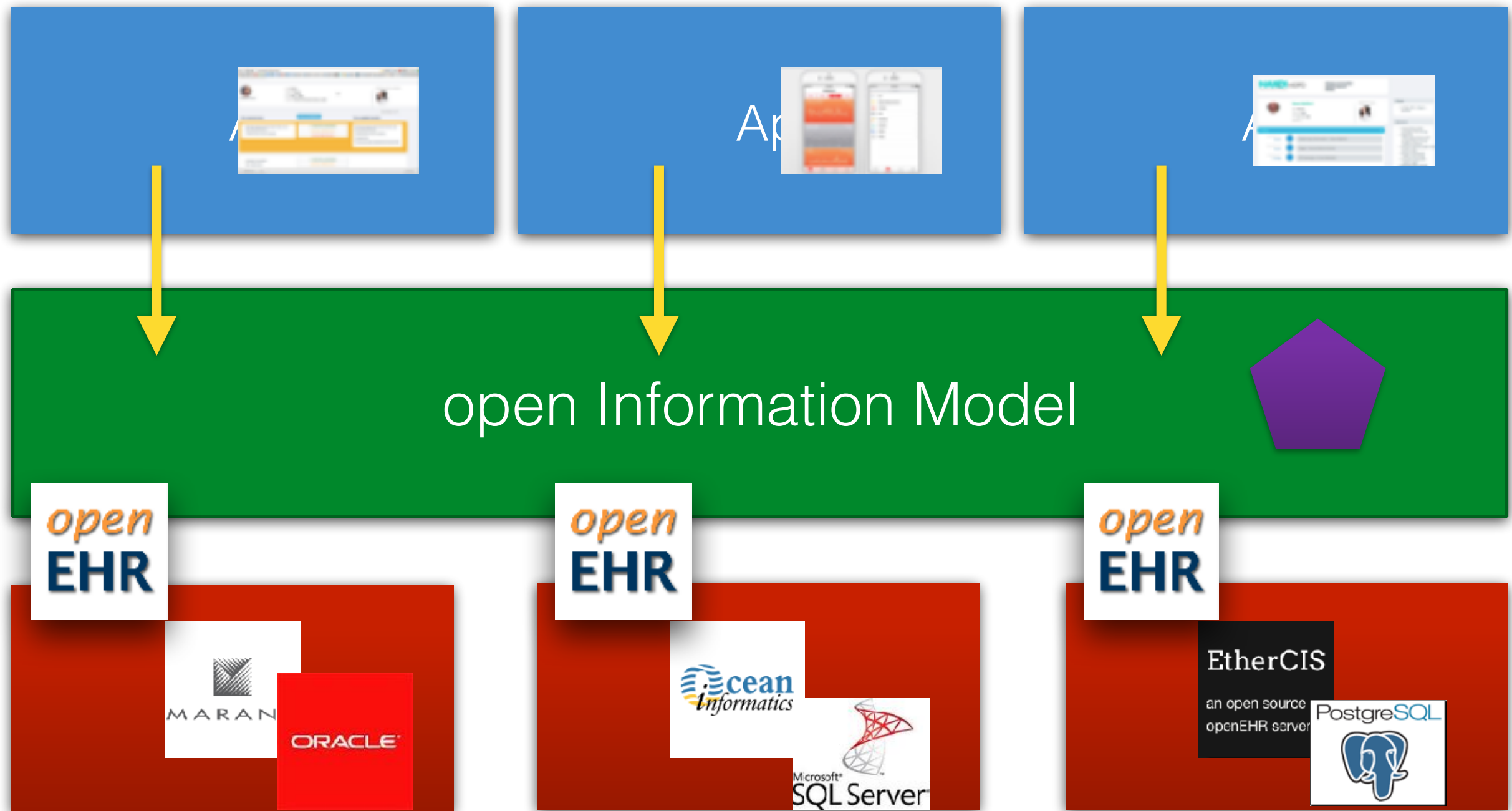
## Foundation News

openEHR Japan Assoc established  
January 04, 2016

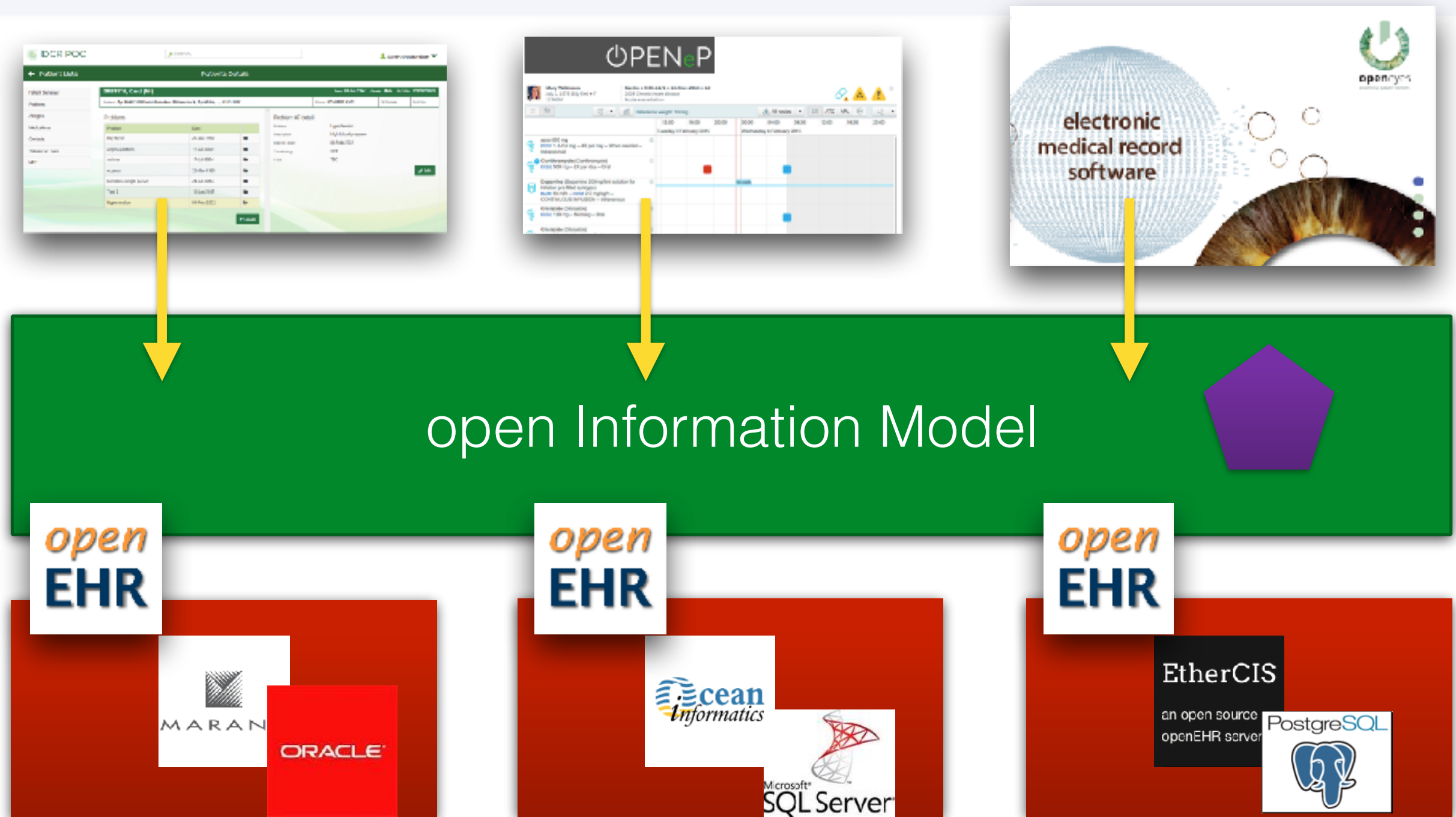
Management Board U  
December 17, 2015

[www.openehr.org](http://www.openehr.org)

# 'CDR'-based architecture



# 'CDR'-based architecture





# 'CDR'-based architecture



EHR Rest API + AQL

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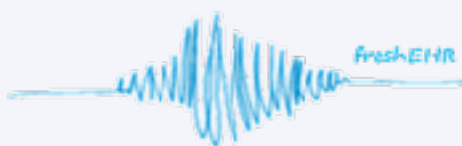


HR Rest API + AQL

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# 'CDR'-based architecture



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# 'CDR'-based architecture



EHR Rest API + AQL

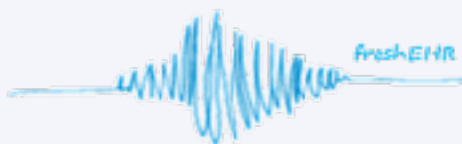
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open

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informatics

Microsoft  
SQL Server



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# 'CDR'-based architecture



EHR Rest API + AQL

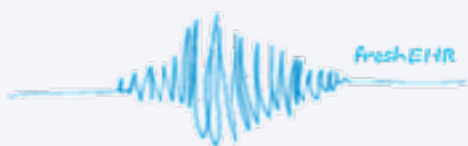
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openEHR server

PostgreSQL



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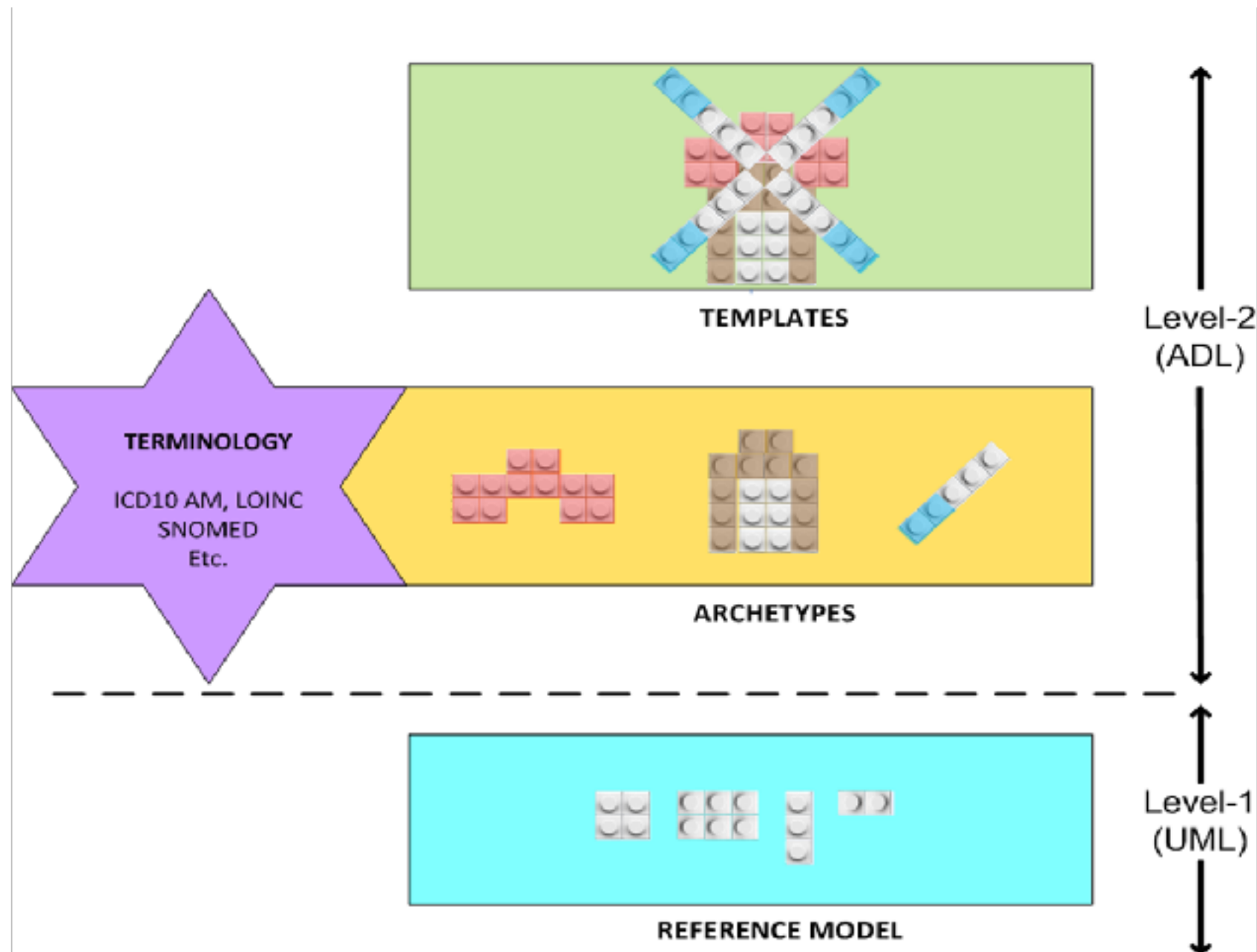
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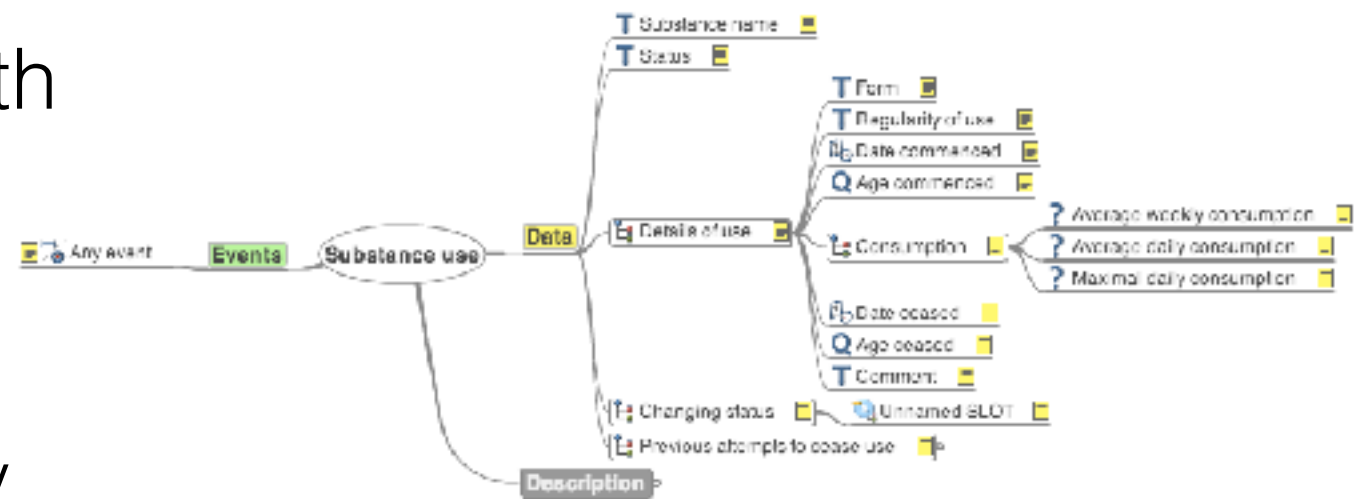
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# Two-level information modelling



# openEHR: Archetypes

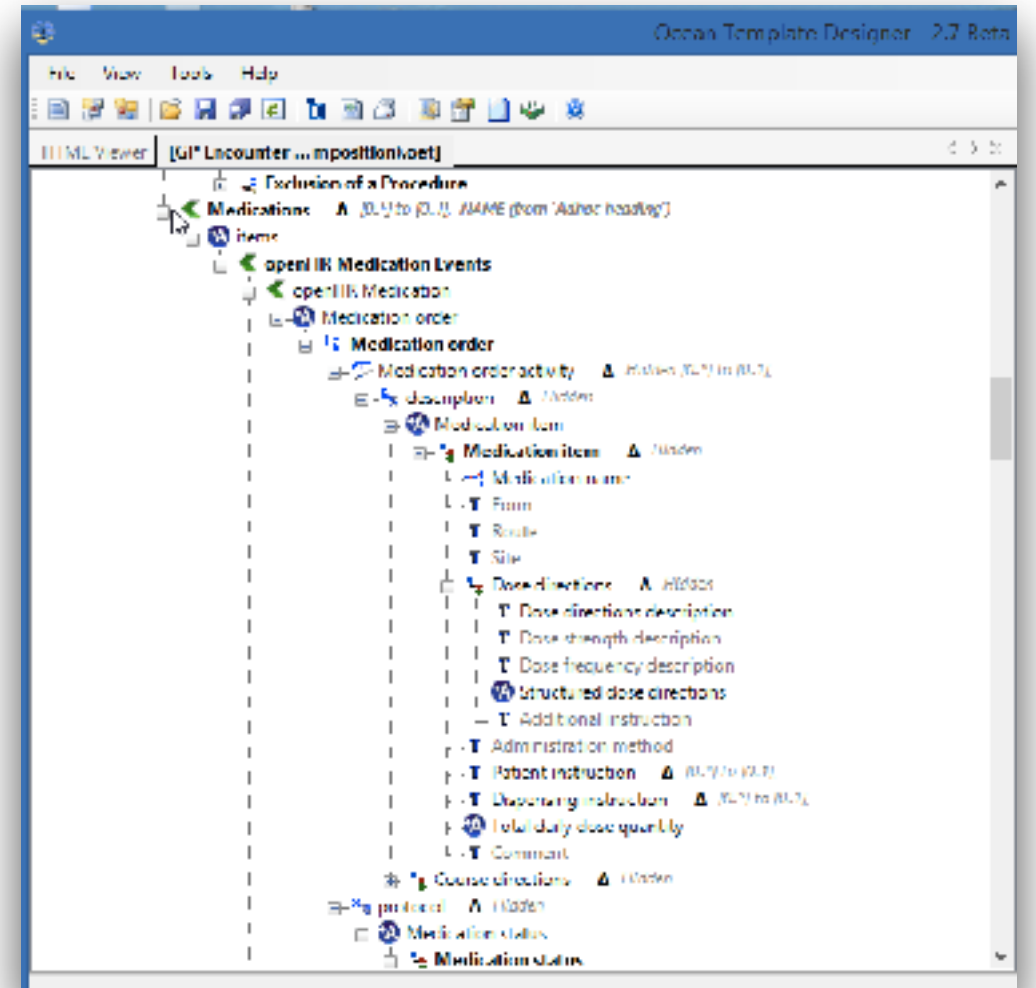
- open source computable models of discrete clinical concepts
- Familiar components of a health record
  - Blood pressure, Body weight
  - Medication order, Family history
  - Urea, Creatinine results
- ‘Maximal dataset’
  - Capture as many clinical perspectives as possible





# openEHR: Templates

- Templates deliver the datasets by aggregating archetypes together
- Key clinical endpoint and start point for generation of technical artefacts
- i.e. openEHR archetypes and templates can be used directly
  - Class libraries, Message schema
  - GUI skeletons, API Profiles



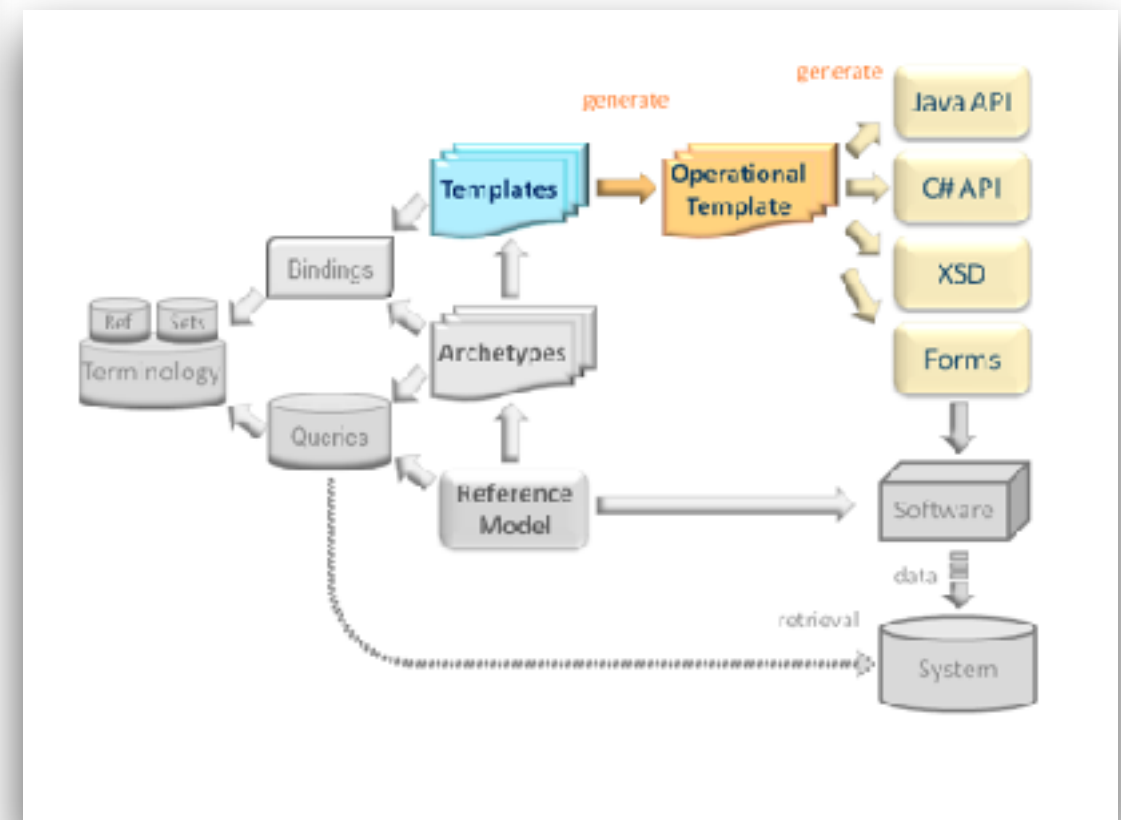
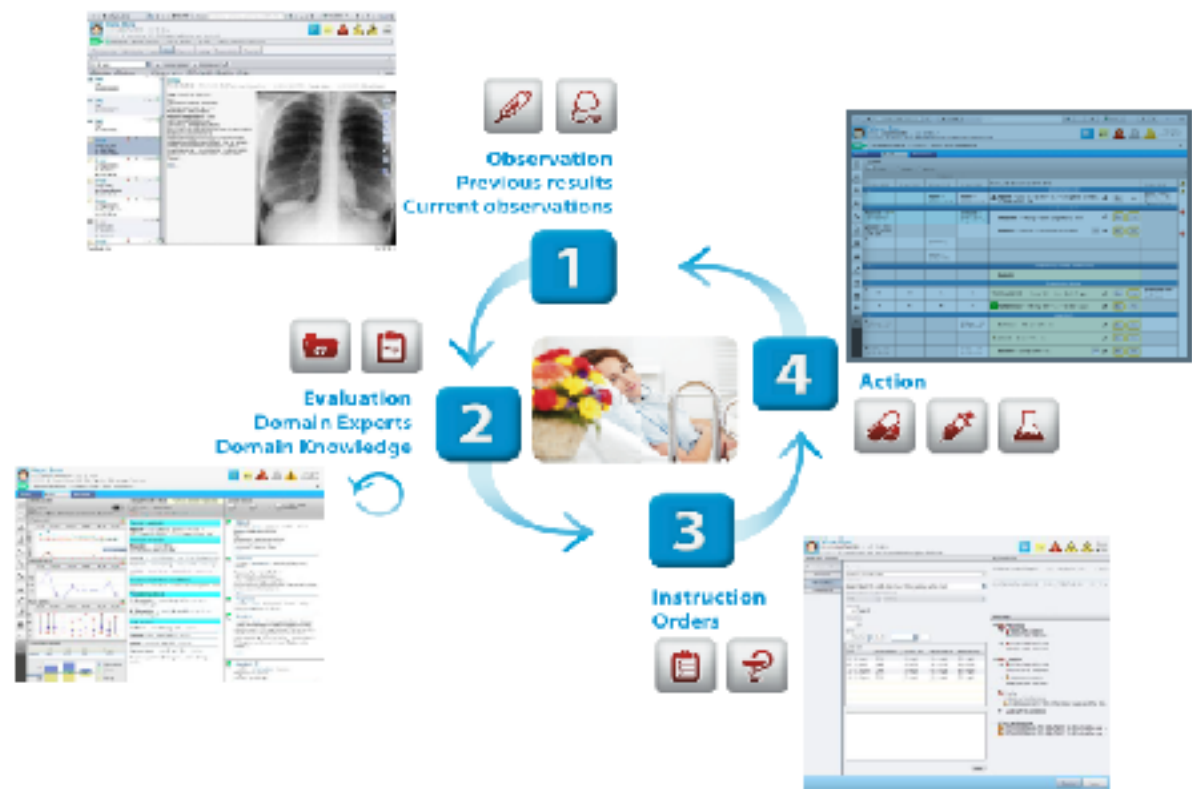
# AQL: Information-model querying

- Information model querying, independent of the actual database querying
  - vendor/technology neutral querying
- To query an openEHR system you only have to know which archetypes are in use.

```
SELECT v/uid/value as composition_id,  
       obs/data/origin/value as measurement_time,  
       obs/data/events/data/items[at0004]/value/magnitude as systolic,  
       obs/data/events/data/items[at0005]/value/magnitude as diastolic,  
       c/context/setting/value as composition_setting,  
       c/name/value as composition_title,  
       c/context/start_time/value as composition_start_time  
FROM Ehr [uid=$current_ehr_uid]  
CONTAINS VERSION v  
CONTAINS COMPOSITION c[openEHR-EHR-COMPOSITION.encounter.v1]  
CONTAINS OBSERVATION obs[openEHR-EHR-OBSERVATION.blood_pressure.v1]  
WHERE obs/data/events/data/items[at0004]/value/magnitude > 185  
ORDER BY c/context/start_time/value
```

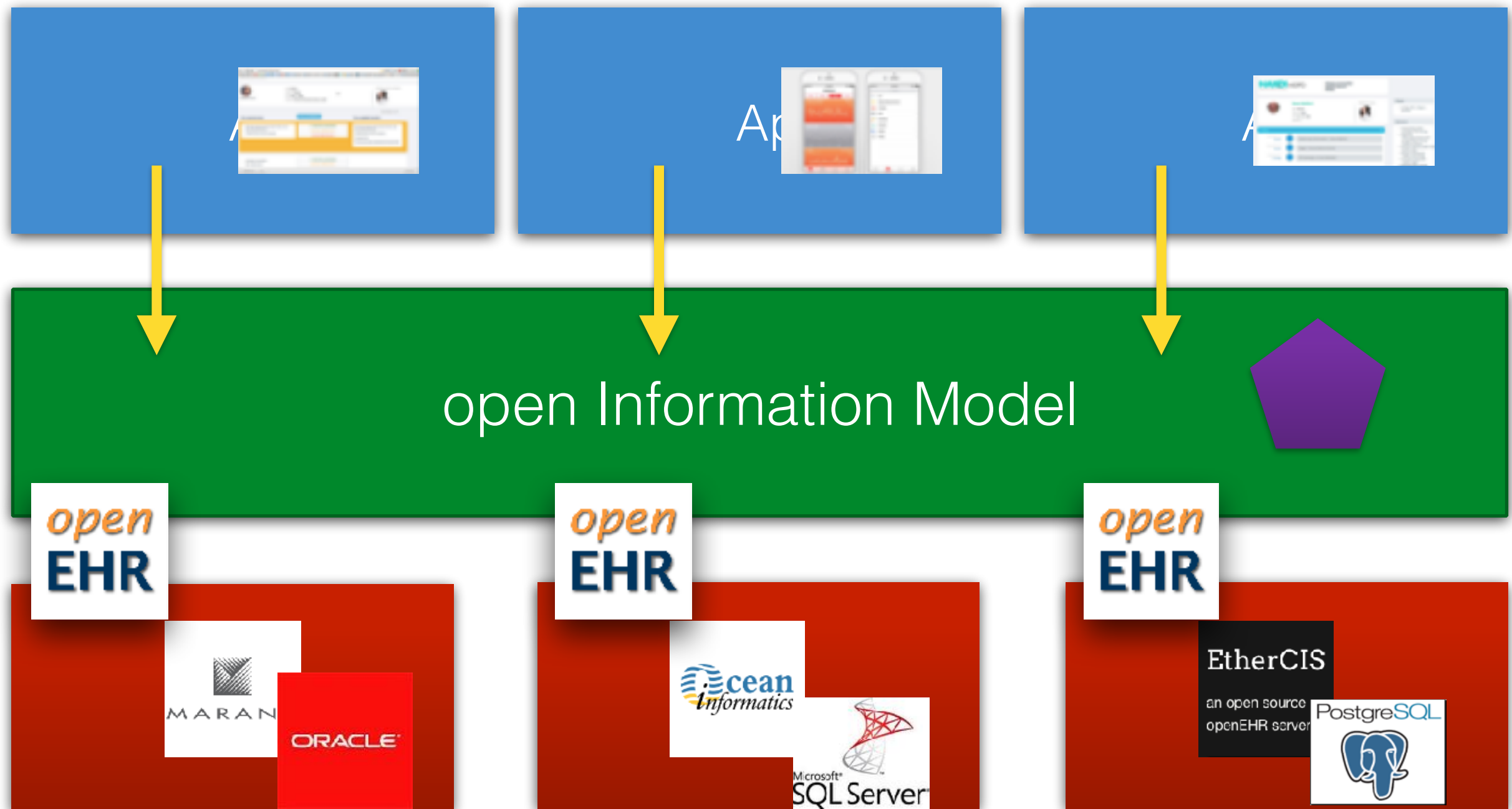
# Clinical Information models factory

## The Clinical Process

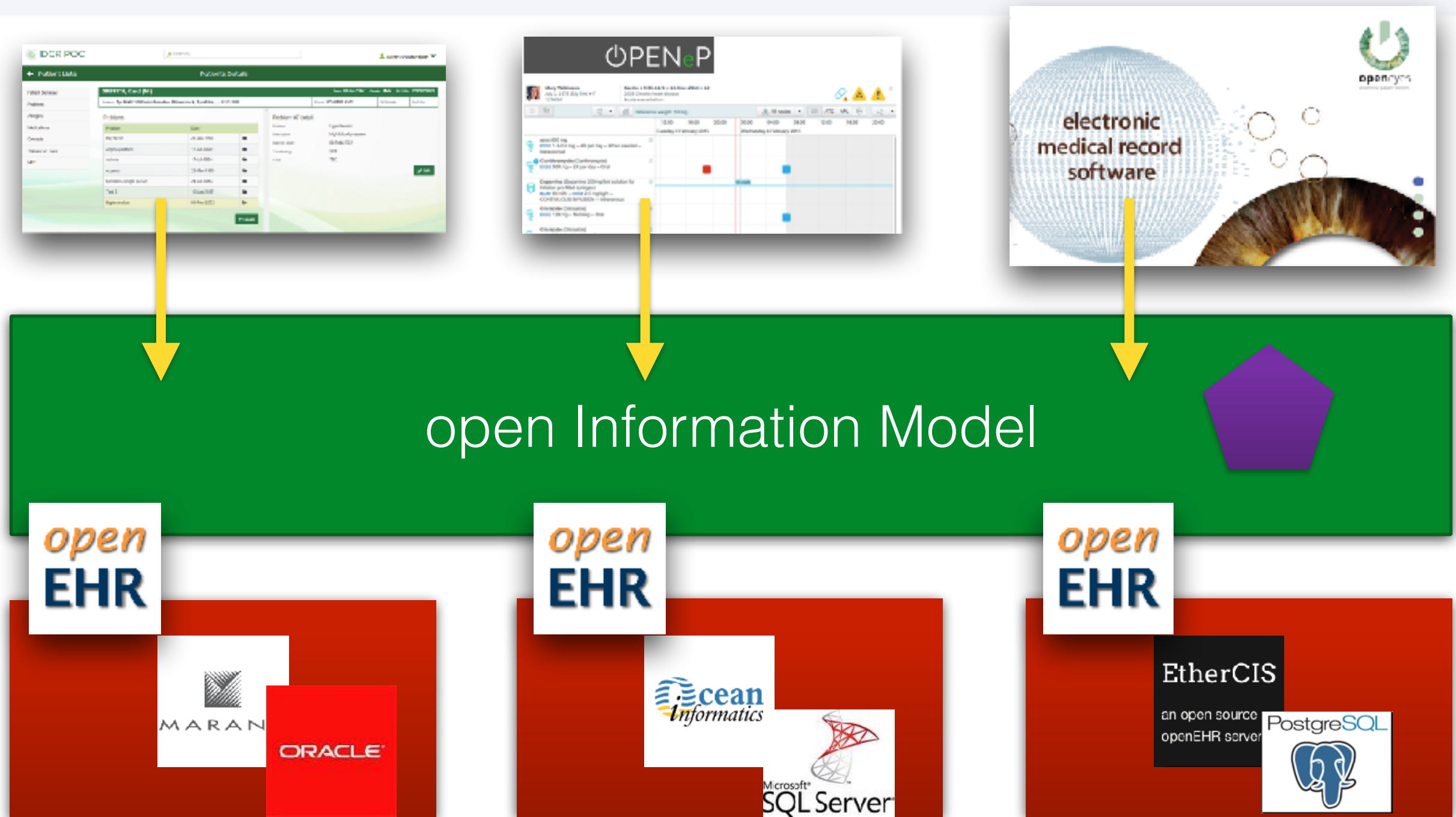




# 'open platform' architecture



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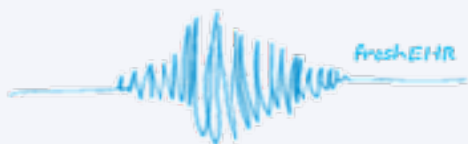


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openEHR CDR



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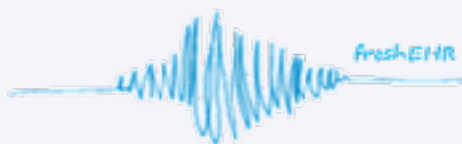
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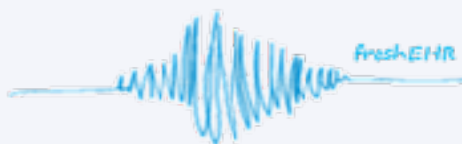
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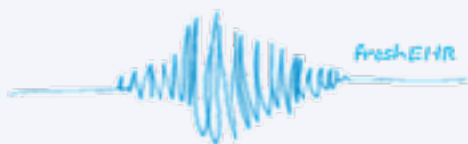
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PostgreSQL



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# 'open platform' architecture



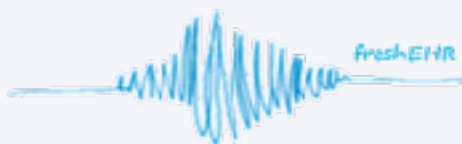
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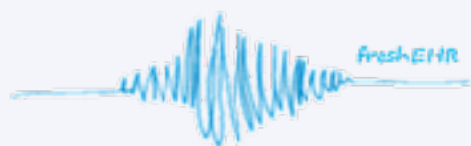
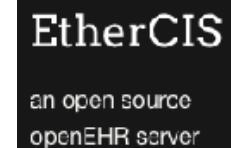
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# The good news...

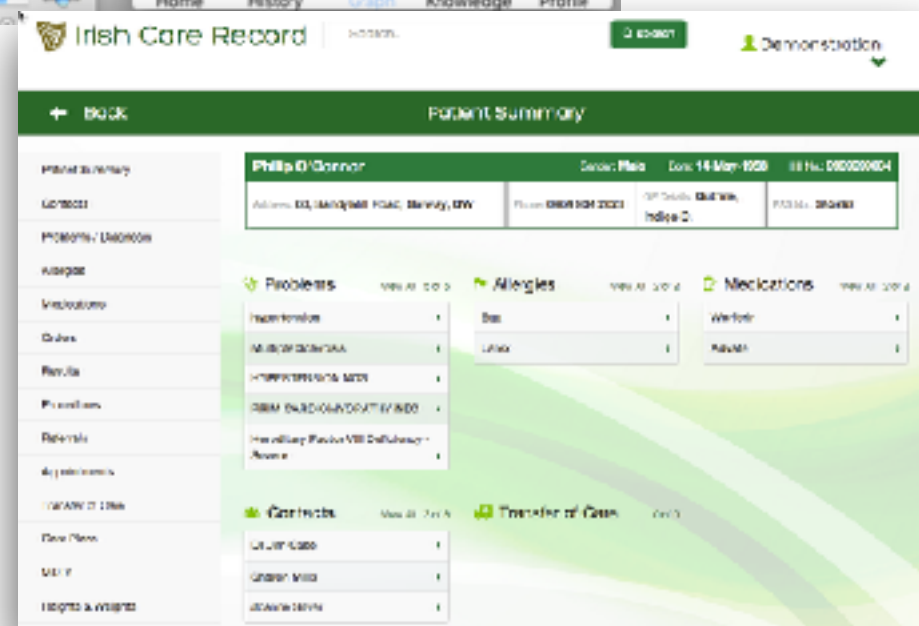
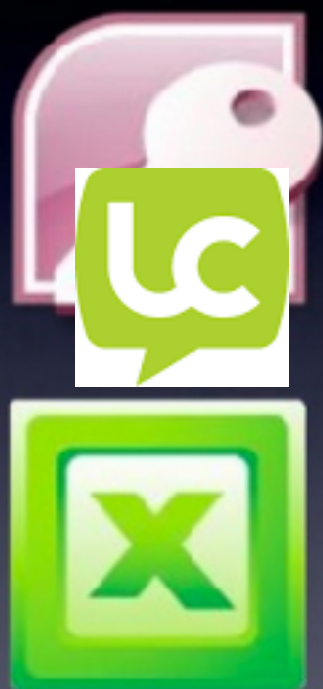
- You do not have to build your own openEHR back-end 'CDR'...
- over 10 providers of openEHR CDR services
- the APIs are compact and easy to use once you understand the basic concepts



# 'feral' systems

## 'Clinical systems'

- Moorfields 18 (+ 50)
- Leeds: 320
- St Thomas': 760
- GOS: 500
- Manchester: 783



# Paracetamol pathway

### Paracetamol Pathway (Prototype - not for use)

1

SU Details

Date:  SU Name:  DOB:  NHS No:

1

Timeline

Date and time of paracetamol ingestion:   
Time elapsed since ingestion:

2

openEHR

Clinical Knowledge Manager

Archetypes • Templates • Termsets • Release Sets • Reviews • Projects • Discussion • Reports

Find Resources Dashboard Paracetamol pathway OPEN way.v0

Archetype ID  
Template ID  
MetaDataSet: Sample Set

**PARACETAMOL OVERDOSE PATHWAY**  
Where not otherwise stated, elements are optional ([0..1]).  
Collapse All Show Annotations Show Paths

other\_context

Timeline

Exposure [0..1]

Paracetamol ingestion

Date of Onset 03/26/2016

protocol

GET

{{openEhrApi}}/rest/v1/composition/{{compositionId}}?format=STRUCTURED

Params

5

key

value

Body

Cookies

Headers (10)

Tests

Status: 200 OK

Pretty

Raw

Preview

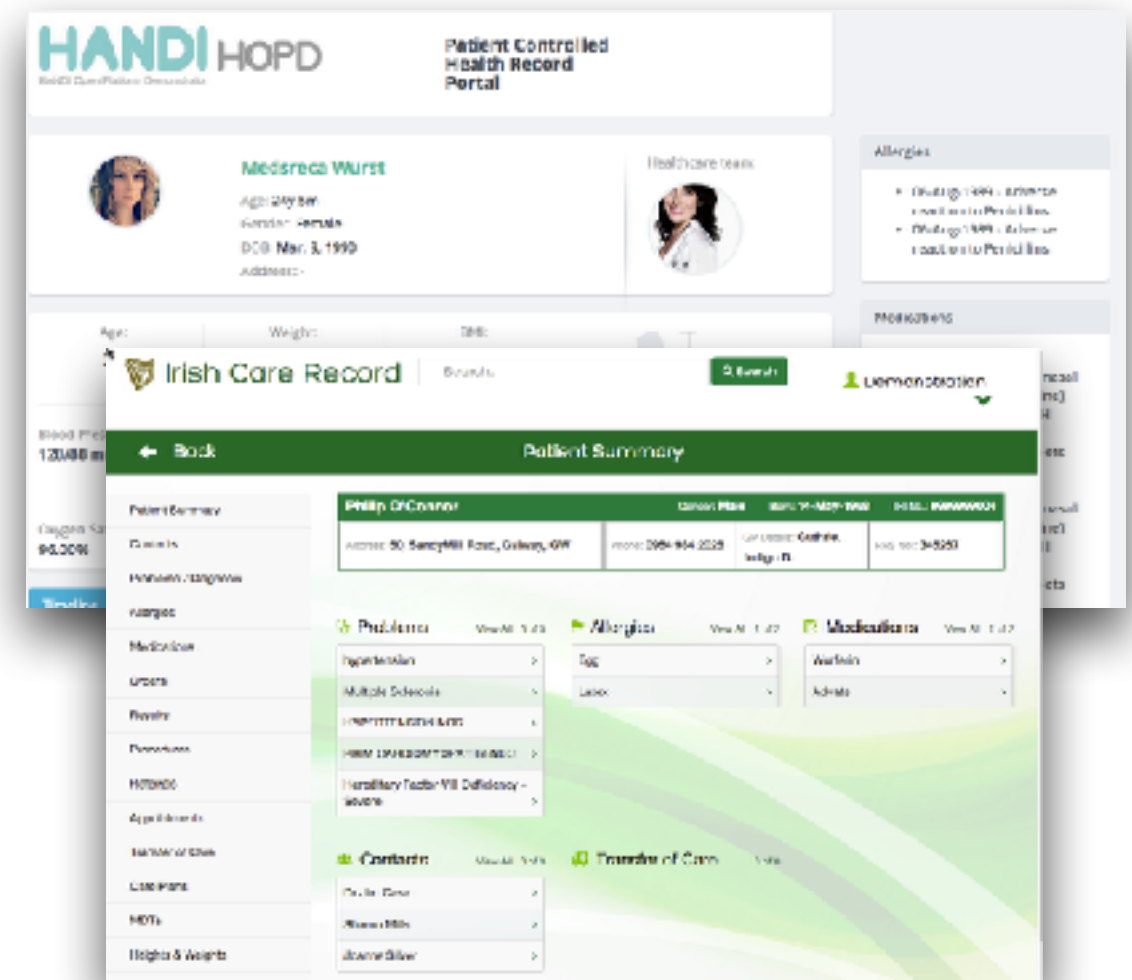
JSON

```
23     }
24     1.
25     "context": [
26     [
27     {
28       "start_time": [
29         "2016-08-03T13:42:26.124Z"
30       ]
31     },
32     {
33       "code": "238",
34       "value": "other case",
35       "terminology": "openehr"
36     }
37   ]
38 },
39 "timeline": [
40 [
41   "exposure": [
42     {
43       "paracetamol_ingestion": [
44         "Paracetamol ingestion"
45       ],
46       "exposure_details": [
47         {
48           "date_of_onset": [
49             "2016-08-03T13:42:26.124Z"
50           ]
51         }
52       ]
53     }
54   ]
55 ]
56 ]
```



# openEHR CDR summary

- Designed for storing and querying rich clinical dataset
- New content is defined directly by clinicians and can be immediately uploaded into the clinical data repository
  - Vendor-neutral data models  
Technology-neutral data models
  - Vendor-neutral data querying  
Technology-neutral data querying





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