



Universidade do Minho
Escola de Engenharia



KEG
Knowledge Engineering Group



CENTROALGORITMI

OpenEHR - The solution for an interoperable development



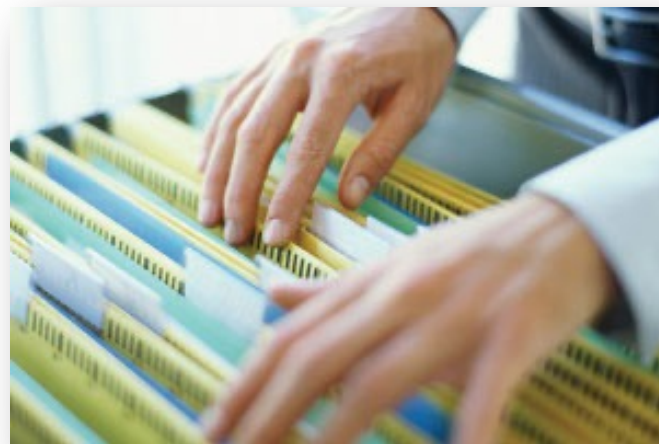
António Abelha

May, 5th, 2021

BACKGROUND

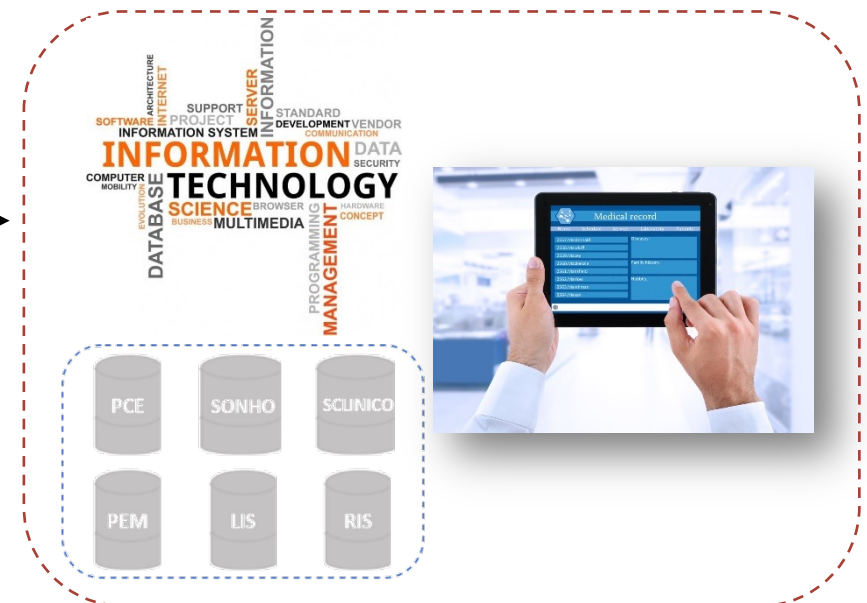
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- TOOLS
- SYSTEM ARCHITECTURE
- CONCLUSION
- PUBLICATIONS

Manual Health Record



Informatization
→
1960

Electronic Health Record (EHR)



Modelling
Automatization

Present

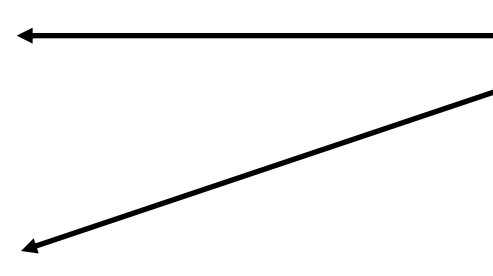
Interoperability

Why?

Structured Electronic Health Record (EHR)

Standards

How?



CONTEXTUALIZATION

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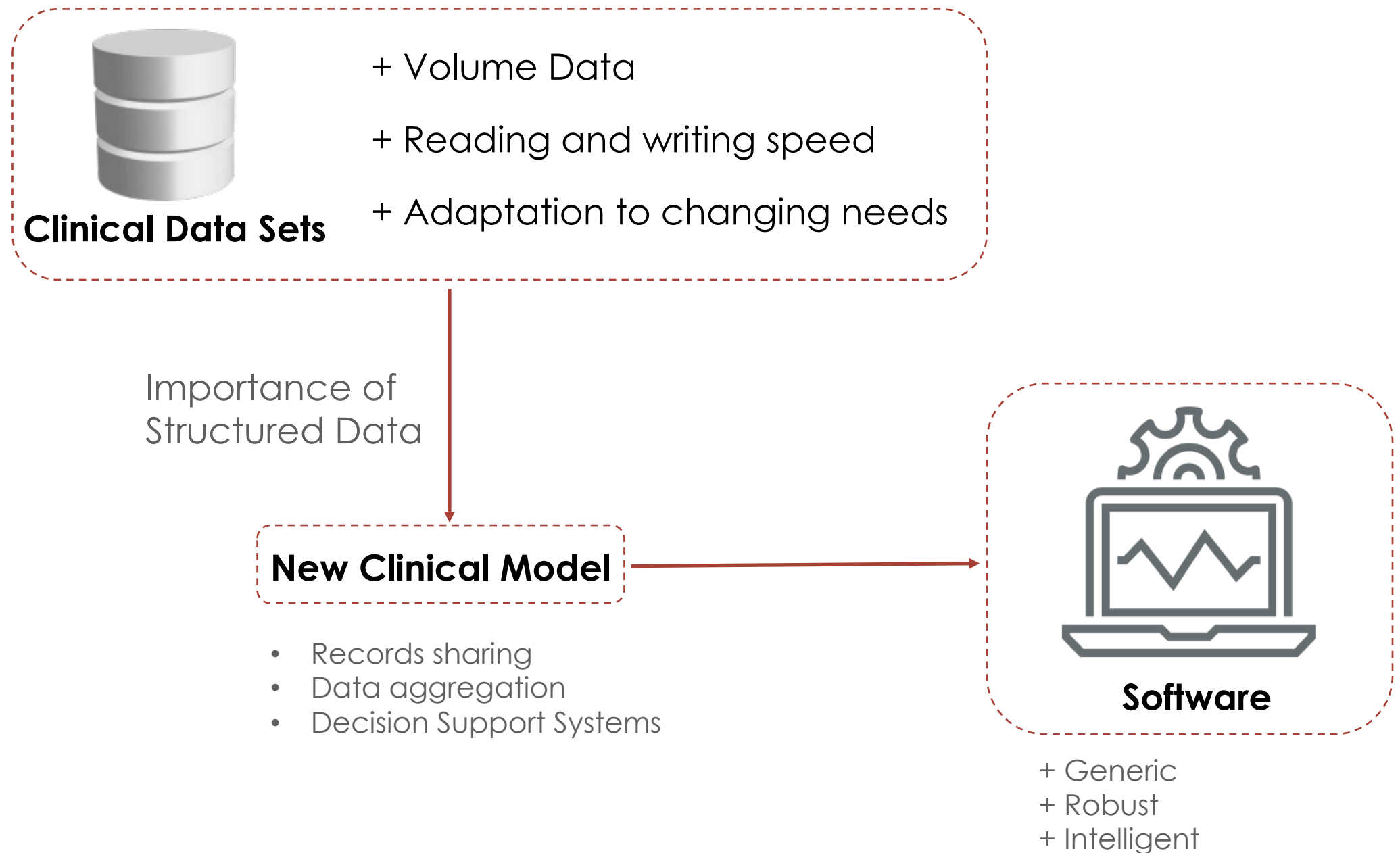
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PROBLEM AND SOLUTION

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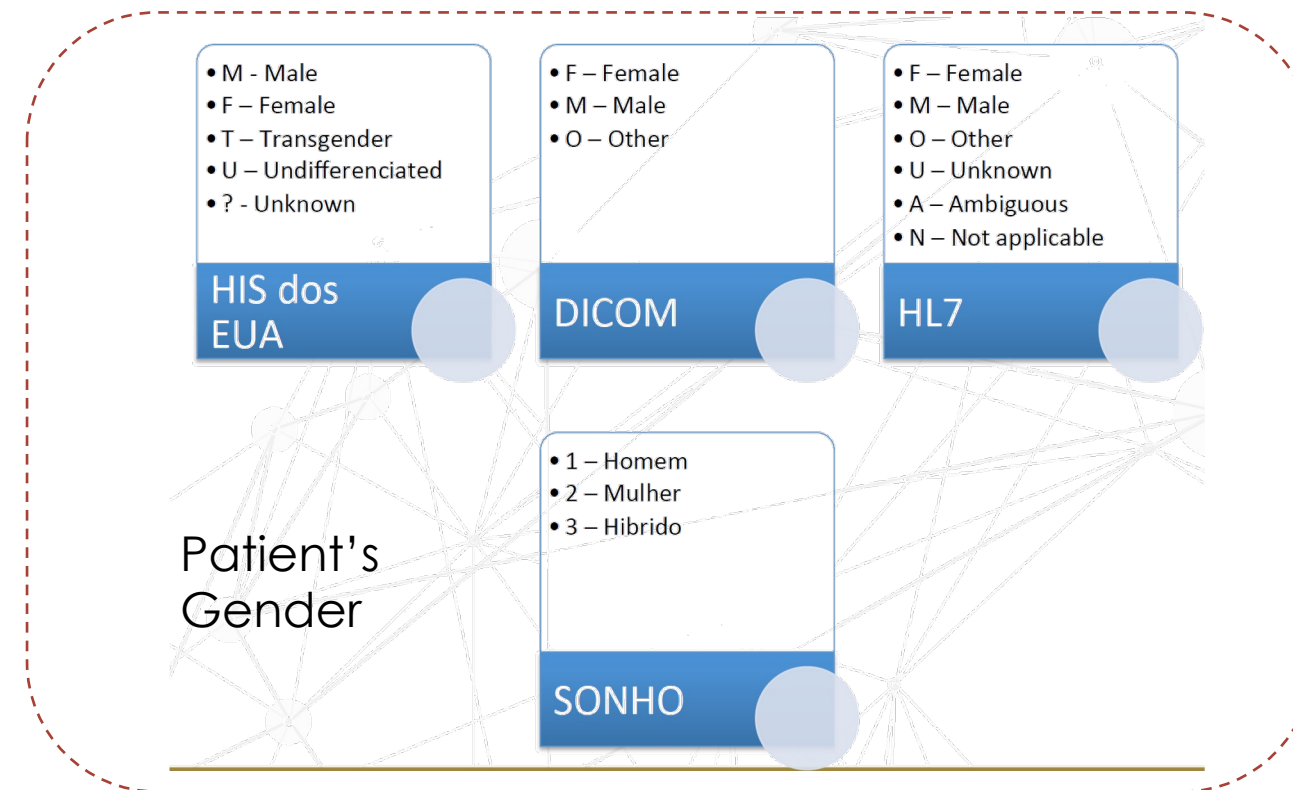
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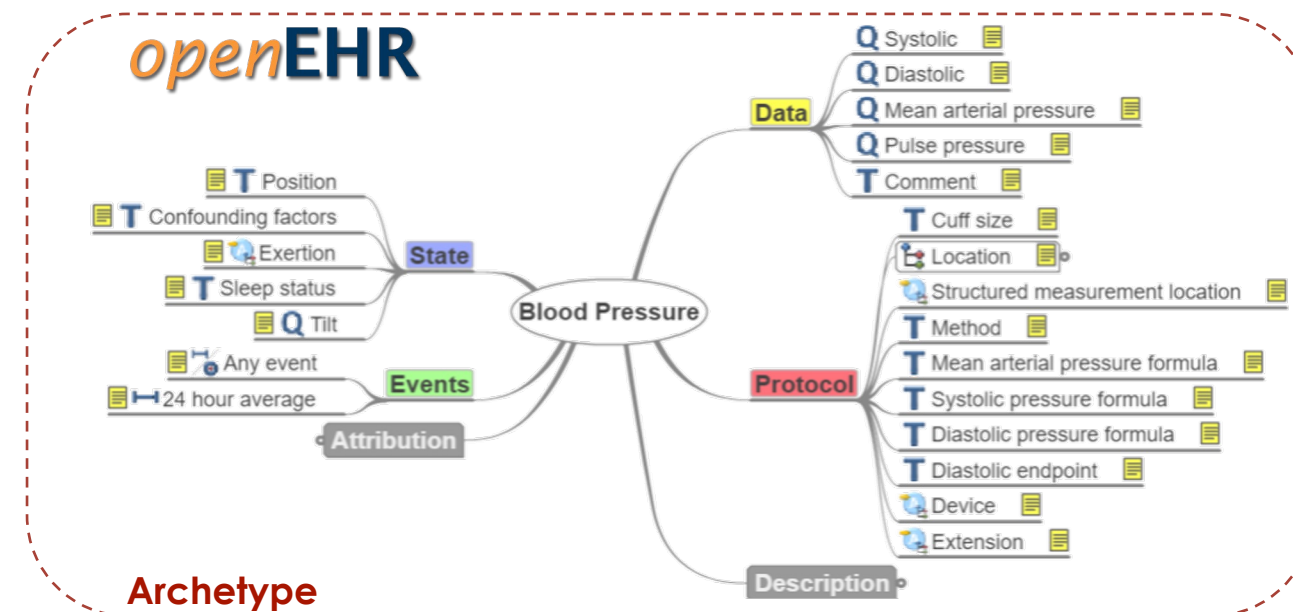
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Problem



Solution



Archetypes



Templates

WHAT IS THE OpenEHR?

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- Non-for-profit organisation since 2001
- An open specification for a Healthcare Information Model
- Promotes an open ecosystem centered on clinical information
- A vendor-neutral and technology-neutral solution
- Dual model to separate clinical and technical terms
- Developed to store and query large clinical datasets
- Clinicians identify new content, which is then automatically submitted to a clinical data repository

WHAT IS THE OpenEHR?

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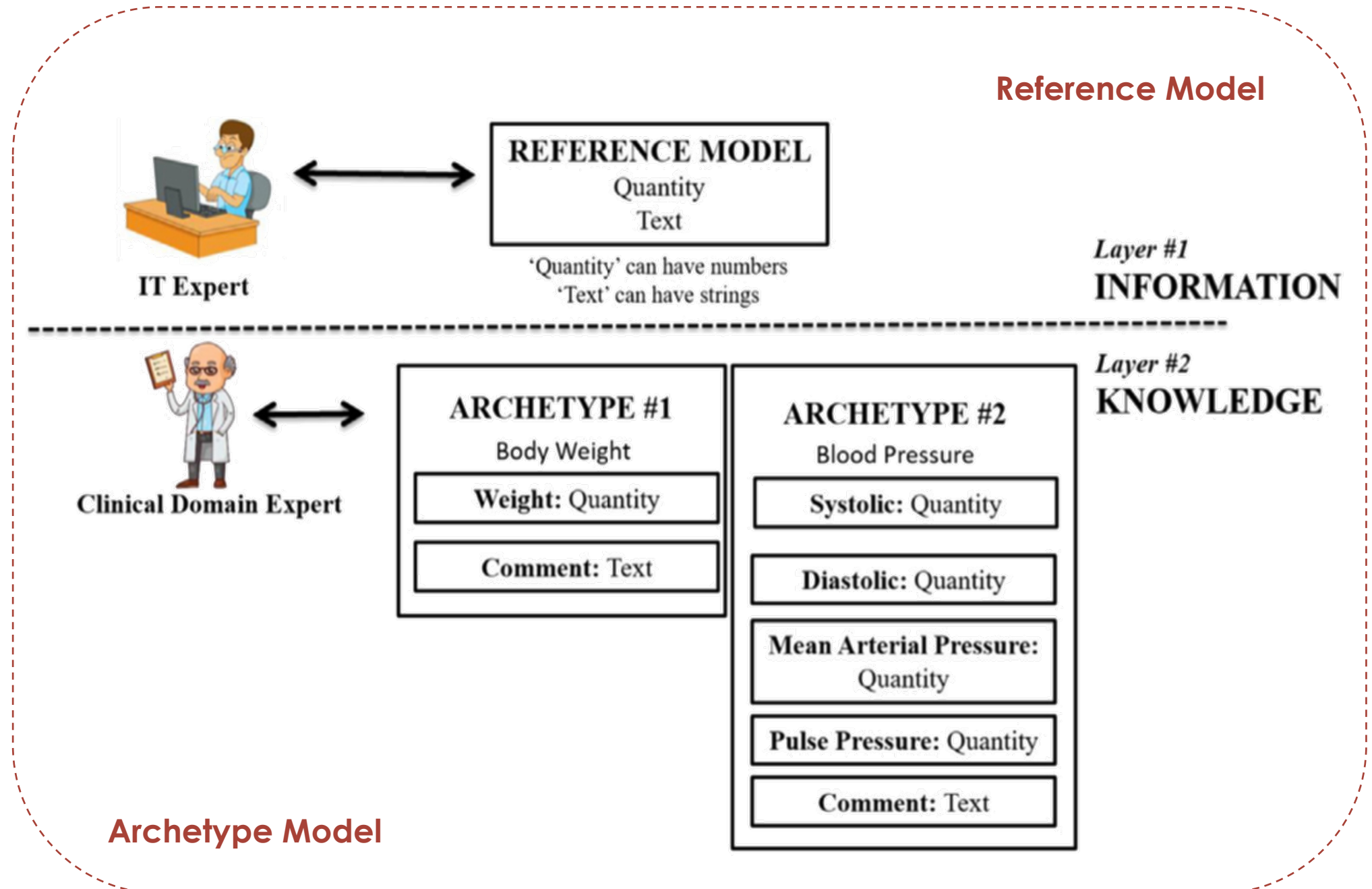
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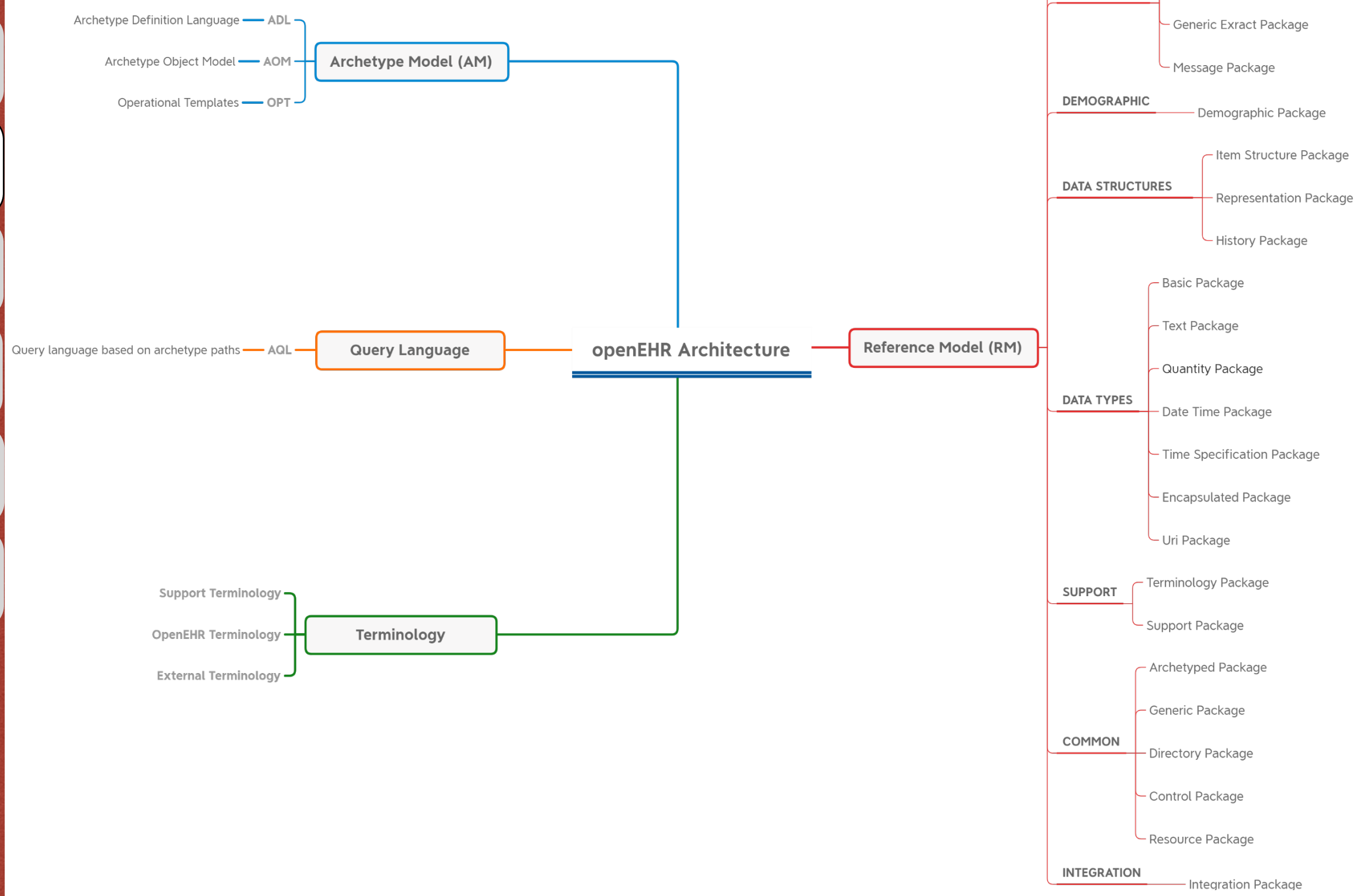
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Dual Model Approach



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INTEROPERABILITY

Syntactic

Reference Model (RM)

Sharing Clinical Information

Structural

Archetypes

Reusability

Semantic

Domain Knowledge
Governance

Standardized Terminologies

↓ Ambiguity of medical terms

↓ Complexity of information structure

↓ Healthcare Costs

↓ Time taken to provide medical attention

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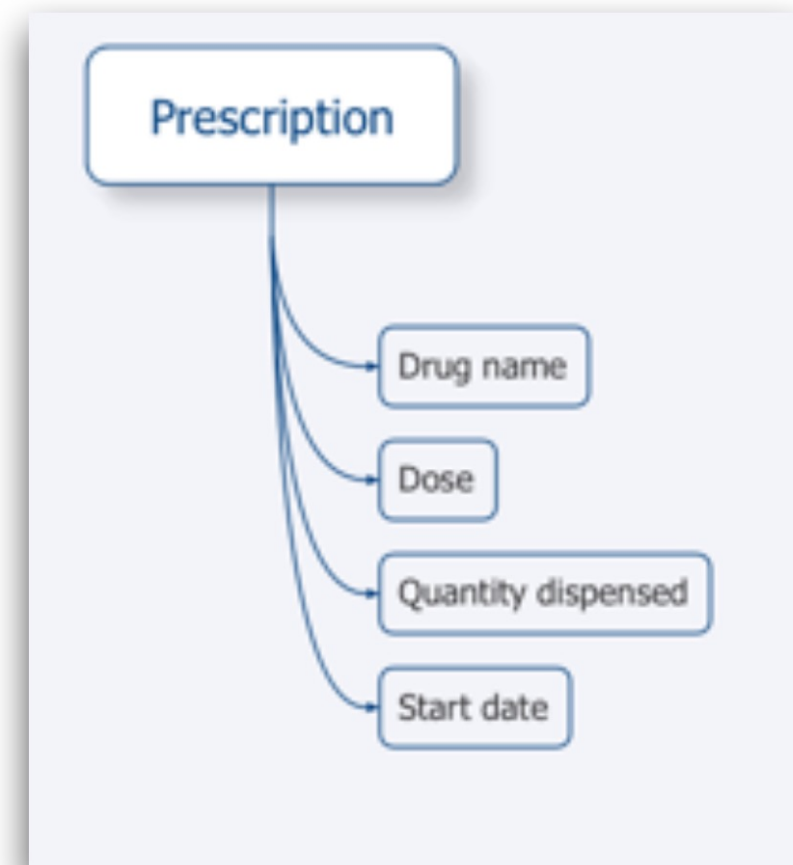
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Classes

- 'Classes' are definitions of data structures
 - the 'assembly instructions' or 'recipe'
 - Classes have attributes (properties)



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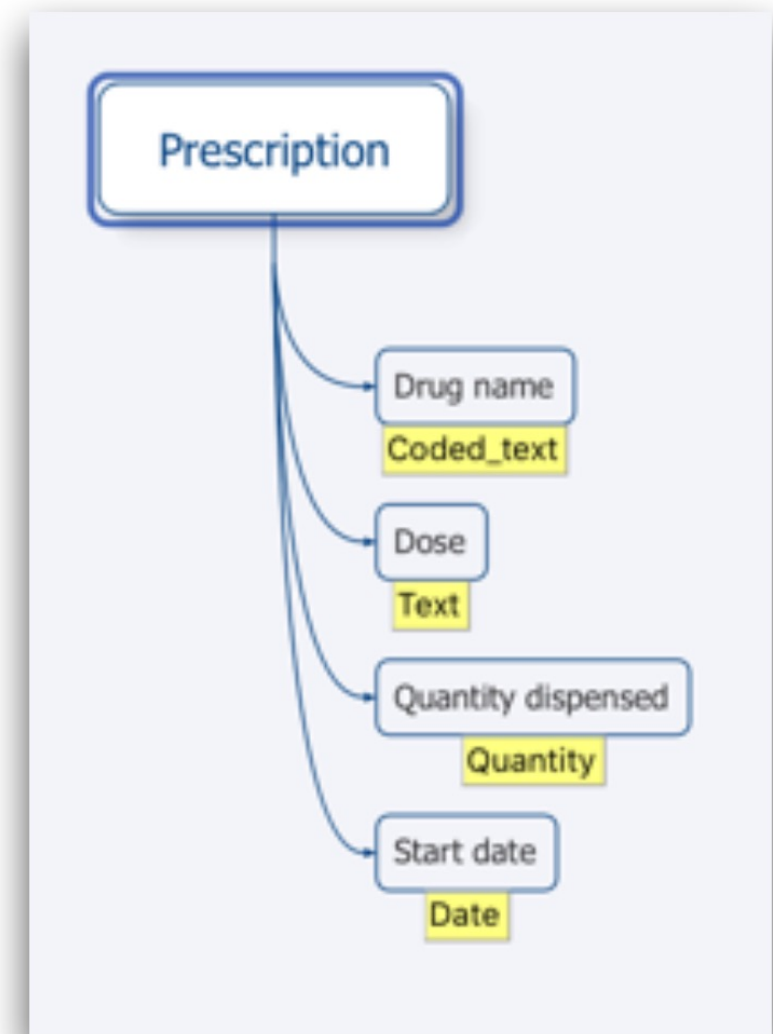
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Datatypes

- Datatypes describe the basic **type** of information being carried
 - a piece of text
 - a quantity
 - a date or time duration
 - an image
 - etc, etc



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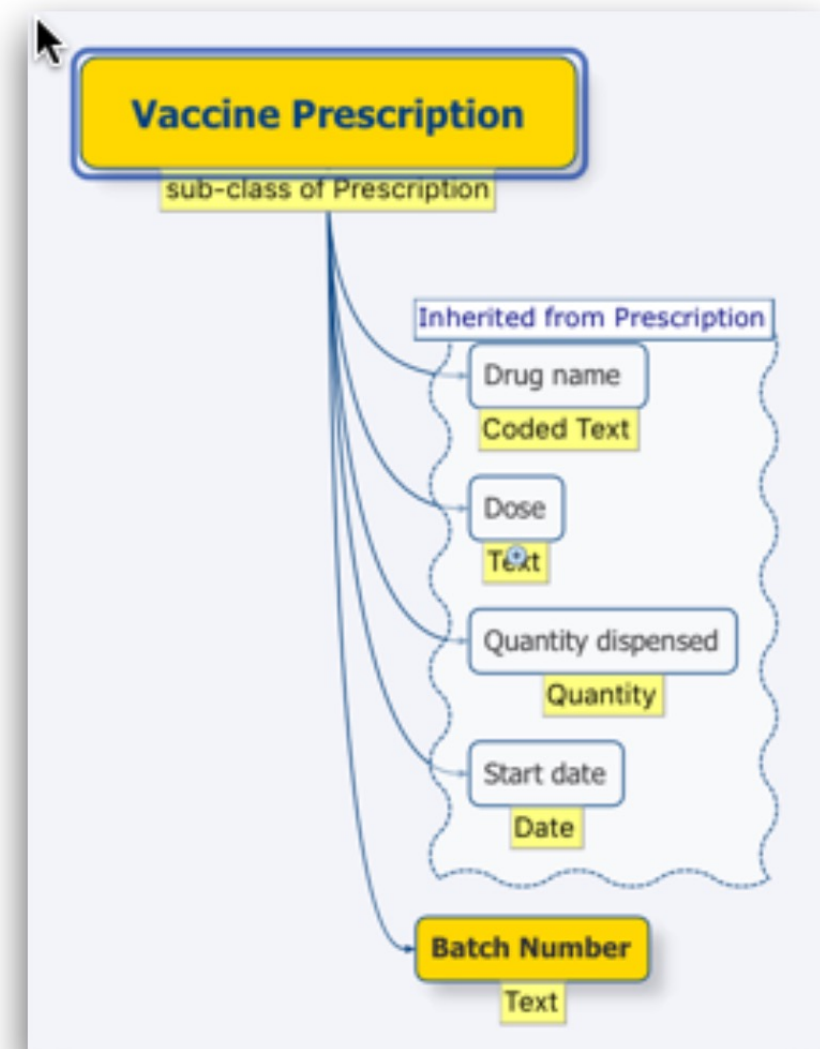
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Inheritance

- Classes can be based on other 'parent' classes
- called inheritance or 'sub-classing'
- the sub-classes 'inherit' all the properties or attributes of the parent
 - Dog is a sub-class of Animal
 - 'Labrador' is a sub-class of 'Dog'
 - If 'Dog' has an attribute of 'tail', The Labrador class will also have 'Tail'



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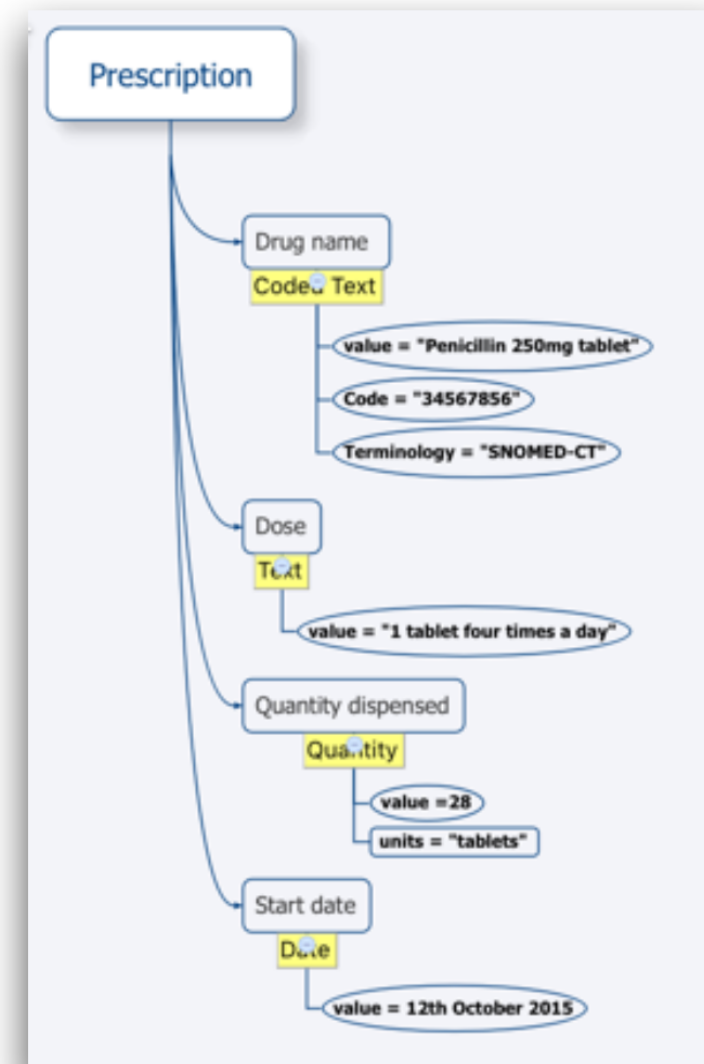
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Objects

- Objects carry the data specified by the classes
- Classes are 'the recipe'
- Objects are 'the cake'



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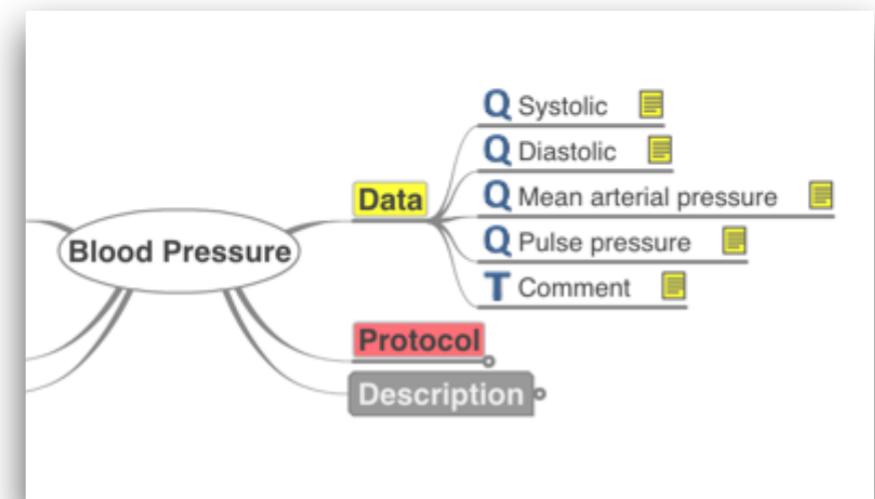
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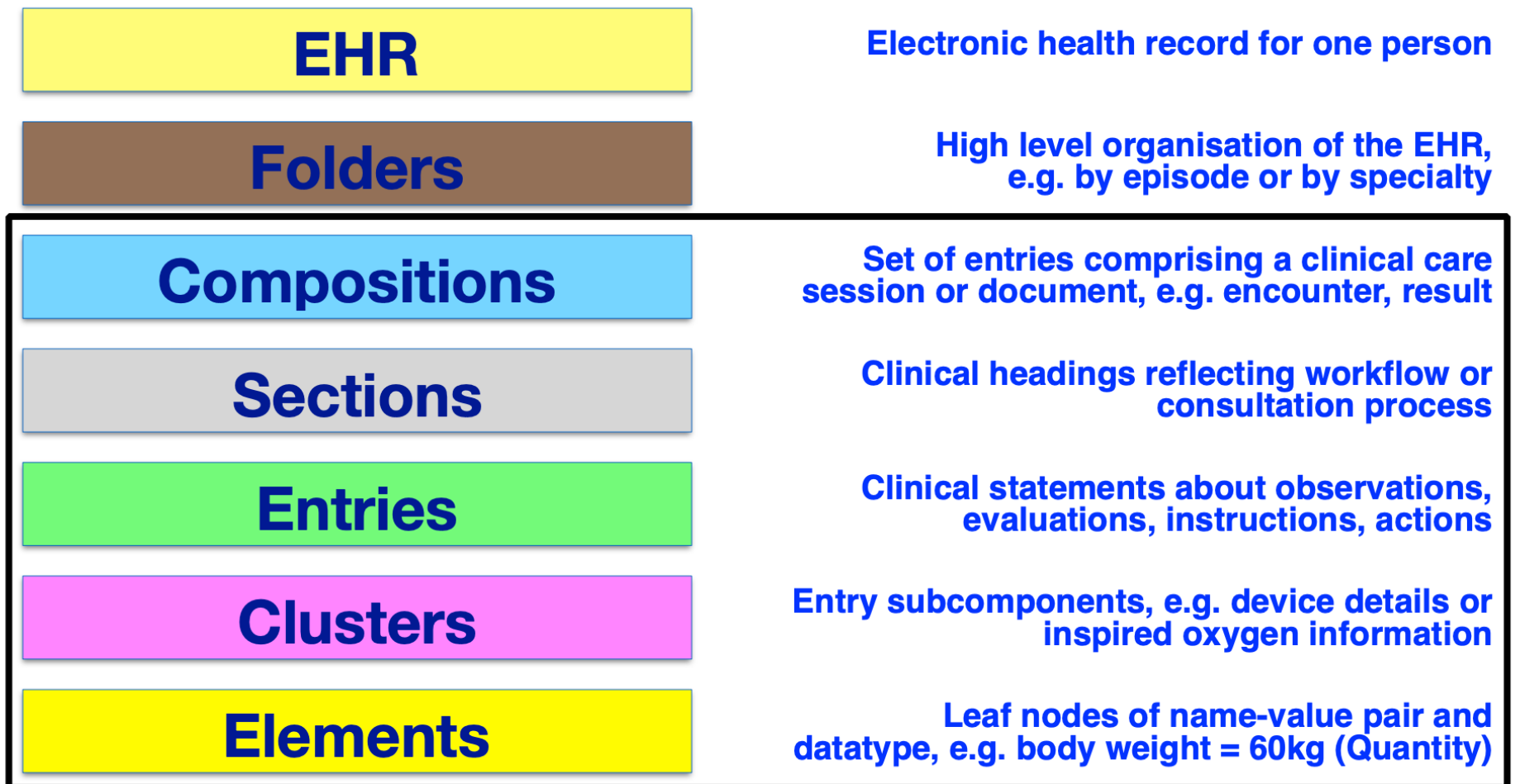
Archetypes and the RM

- Archetypes are built on top of the RM classes and 'inherit' their attributes
 - e.g. An Observation archetype such as Blood pressure inherits the attributes of the RM OBSERVATION class
- Archetypes use the RM datatypes
- Most of these properties are technical but some are important to clinical modellers



WHAT IS THE OpenEHR?

Archetypes are based on RM 'classes'



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WHAT IS THE OpenEHR?

Key openEHR Classes

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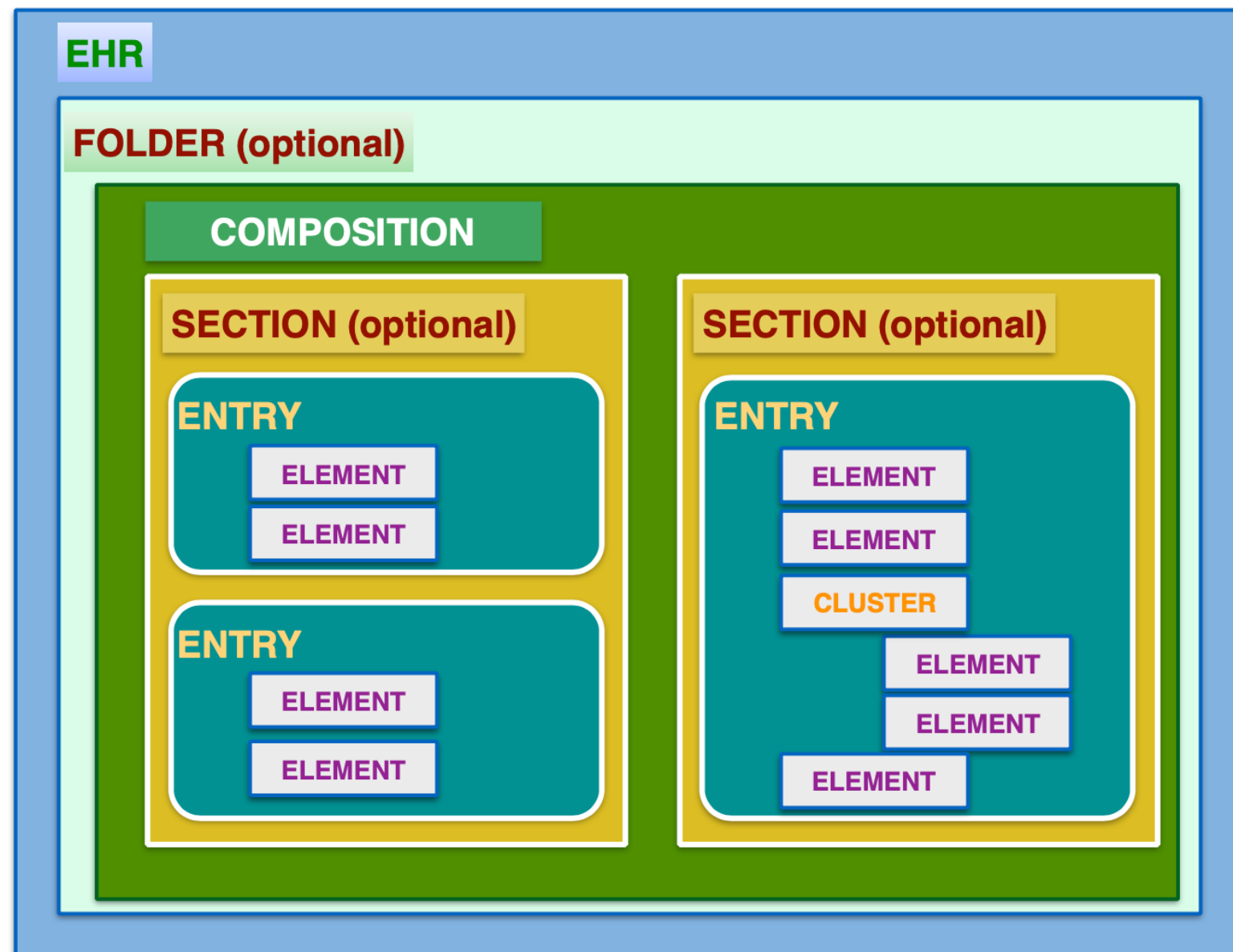
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WHAT IS THE OpenEHR?

openEHR data objects

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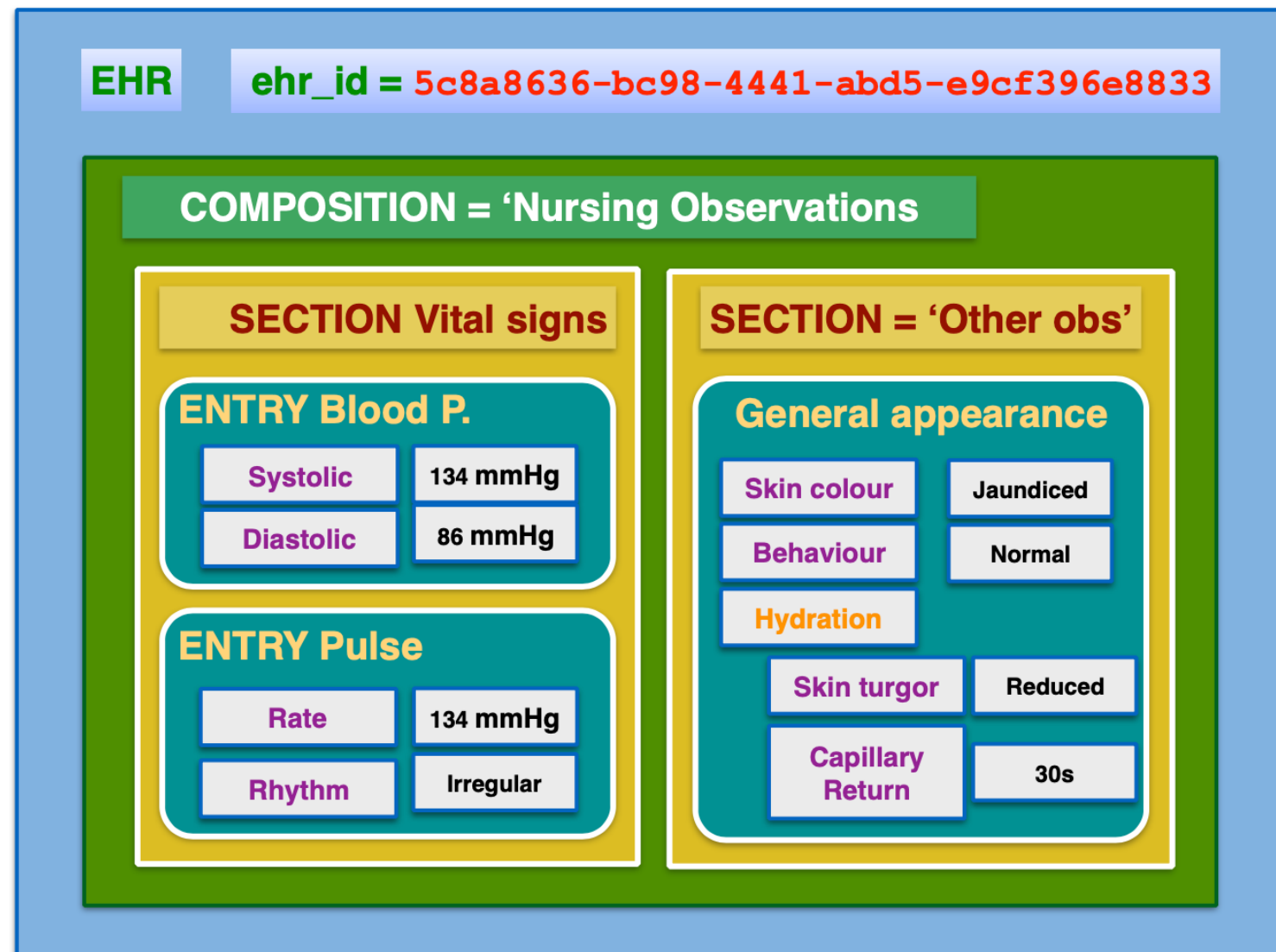
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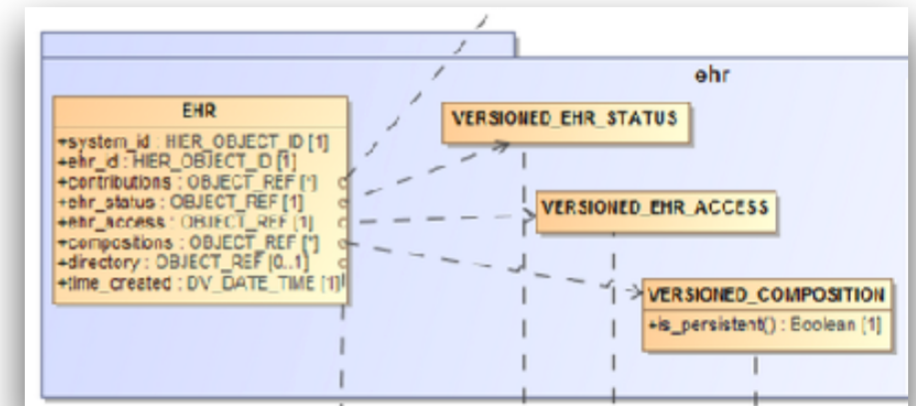
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EHR

- Top-level container for all of the data for a **single patient**
- Each EHR has a unique, anonymous ID the `ehr_id`
- This needs to be associated with a real-world identifier e.g NHS Number to allow the patient to be identified



WHAT IS THE OpenEHR?

Composition - the document container

- Root 'document' for clinical data
- Carries most key medico-legal metadata
 - composer (clinical_author), start_time, end_time
 - organisation, clinical setting
- All recorded patient data saved inside a Composition
- Carries unique ID
 - UID::serverID::Version_Suffix
 - `5c8a8636-bc98-4441-abd5-e9cf396e8833::ripple_osi.ehrscape.c4h::1`
- Versioned
 - All changes will create a new version

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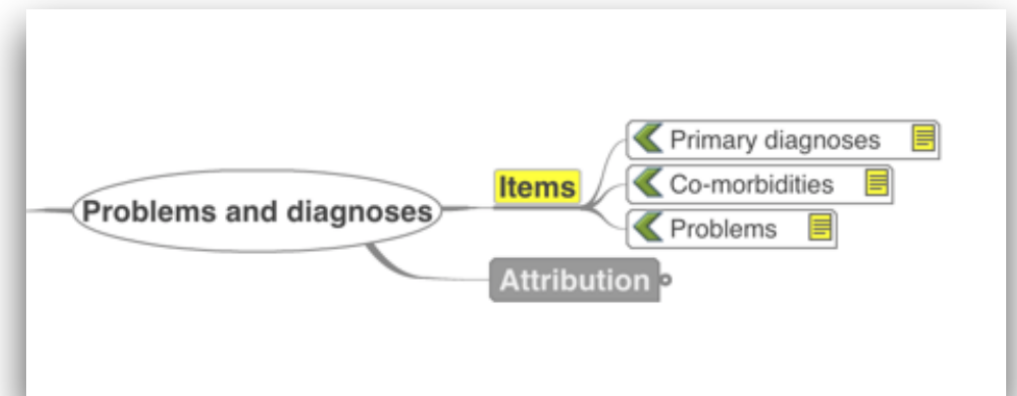
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SECTION

- Used to divide complex compositions into manageable pieces
- Just for human navigation and organisation
- Can be nested
- No important clinical RM attributes



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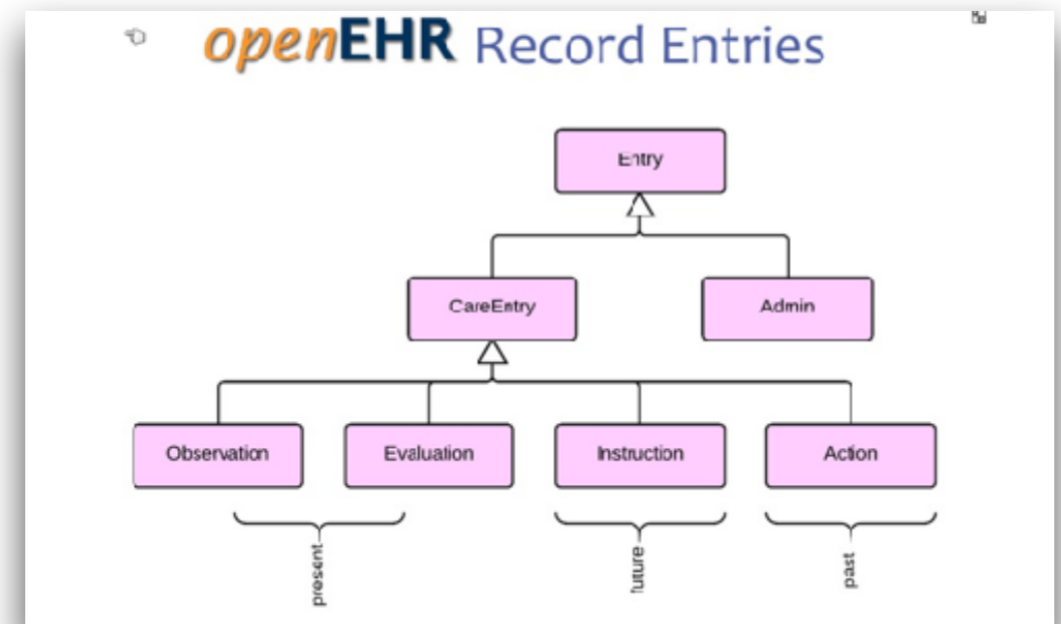
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ENTRY classes

- A set of ENTRY sub-classes **carry all of the clinical payload**
- These are organised to fit the '**Clinical investigator**' cycle
 - OBSERVATION
 - EVALUATION
 - INSTRUCTION
 - ACTION
 - ADMIN ENTRY



WHAT IS THE OpenEHR?

RM attributes for Observations

- **Provider** (optional 'provider of information', where this differs from the Composer)
- **Subject** (optional where record is not about the patient)
- **Participations** (Other people involved)
- **Origin**
 - The start dateTime of the Observation
 - The duration of the observation
- **Event-Time**
 - The start date_Time of an individual event
 - Useful when there are multiple samples for one test
 - e.g pulse / BP monitoring.

WHAT IS THE OpenEHR?

RM attributes for Instructions

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- **Provider** (optional 'provider of information', where this differs from the Composer)
- **Subject** (optional where record is not about the patient)
- **Participations** (Other people involved)
- **Activities**
 - allows multiple chained 'sub-instructions'
- **Narrative** (mandatory safety feature)
 - needed in data, to ensure a complex instruction can always be dropped back to simple narrative
- **Timing**
 - Complex timing schedule for the whole instruction (rarely used)

WHAT IS THE OpenEHR?

RM attributes for Actions

- **Provider** (optional 'provider of information', where this differs from the Composer)
- **Participations** (Other people involved)
 - e.g. Operating assistant
- **Time** (the date and time that the action was performed)
 - e.g. date of a procedure or a prescription
- **Current_status and careflow_step**
 - the workflow status of the Action
 - e.g. planned, in-progress, completed, cancelled

WHAT IS THE OpenEHR?

RM attributes for Quantity datatype

- Units
 - e.g. mmHg, mmol/l, /min
- Normal_range
 - For lab or device normal ranges
 - e.g. 20-46 mmol/l
- Other reference ranges
 - For age or sex-specific reference ranges
 - Normal range for children : 18-28 mmol/l
- Magnitude_status
 - To allow numeric to be qualified
 - E.g ≤ 5 (Less than or equal to 5)
 - ~ 7.3 (approximately 7.3)
- Normal_status
 - High, normal, low based on HL7 lab messages
 - e.g. HHH,HH,H, ,L,LL,LLL



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RM attributes for Text/CodedText datatype

- Any Text datatype can also act as a CodedText datatype
 - if you have defined an element to be Text, it can still carry CodedText
- **Defining_code**
 - The actual code of a CodedText e.g. “123478-AS”
 - The terminology/version of the CodedText e.g. “ICD-10”
- **Mappings**
 - to external terminologies
 - e.g. The original code is an internal code “at007::Left” but is mapped to SNOMED code |123456|left|

WHAT IS THE OpenEHR?

Contributions / versioning

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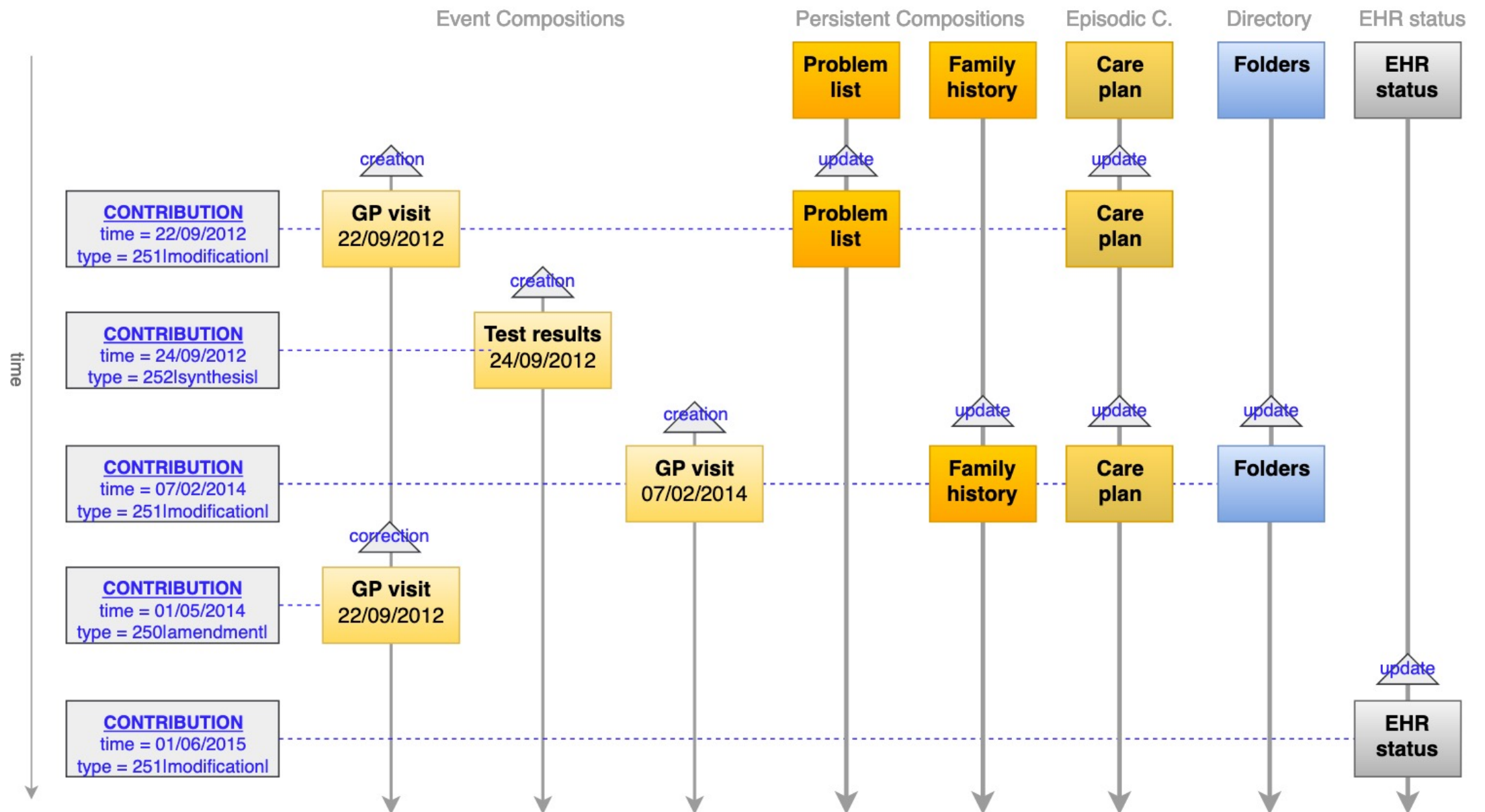
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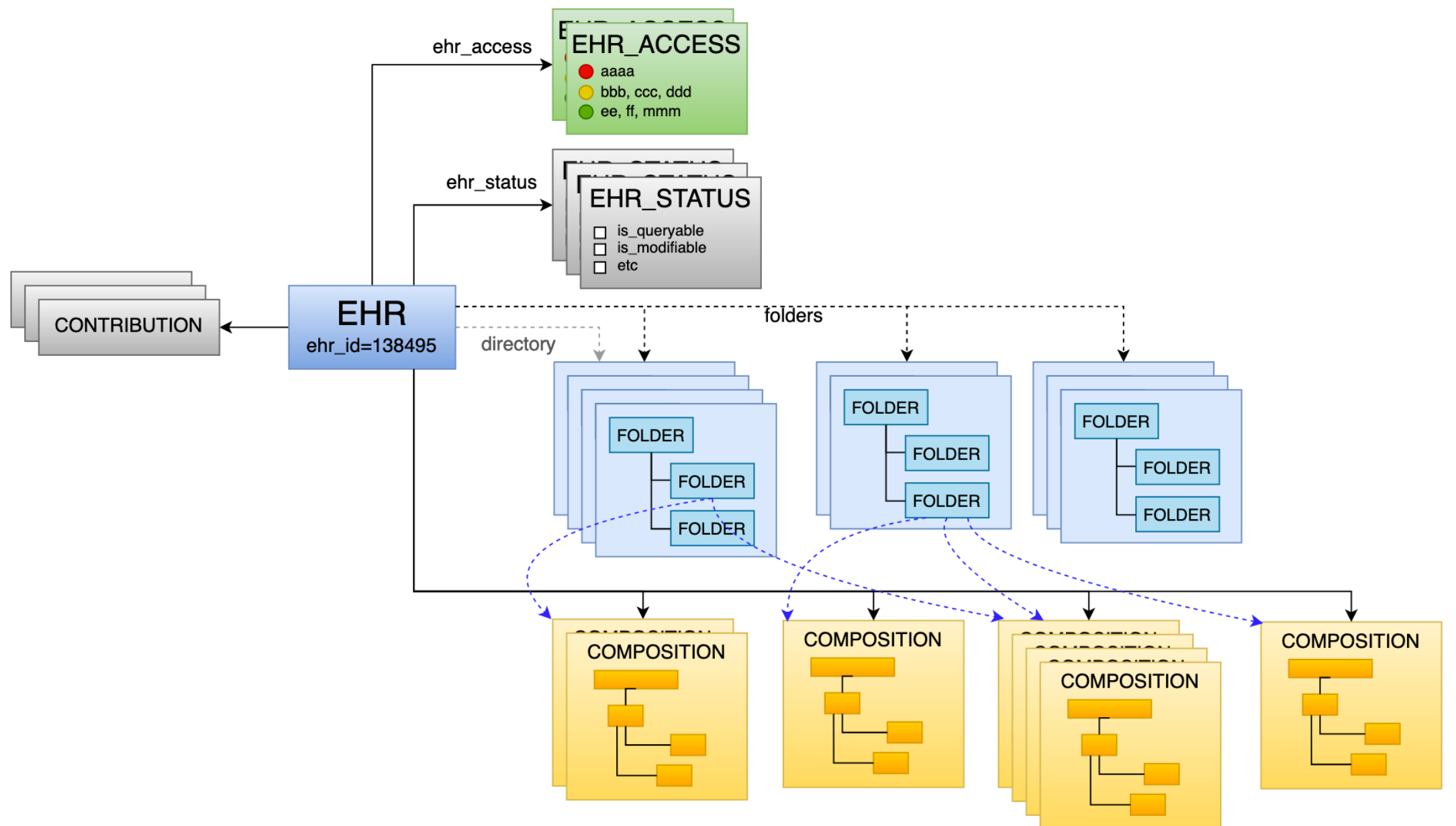
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Contributions / versioning



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WHAT IS THE OpenEHR?

Episode vs Longitudinal persistence

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- **Longitudinal Persistence**
 - Some persistent summaries should exist and be updated throughout the patient's lifetime
 - End of Life summary, GP problem list
- **Episodic Persistence**
 - Most outpatient and hospital summaries e.g Allergy lists, Problem lists need to be re-created at admission, then maintained for the period of admission.
 - A new Problem list may need to be created for each episode of care

WHAT IS THE OpenEHR?

Episode vs Longitudinal persistence

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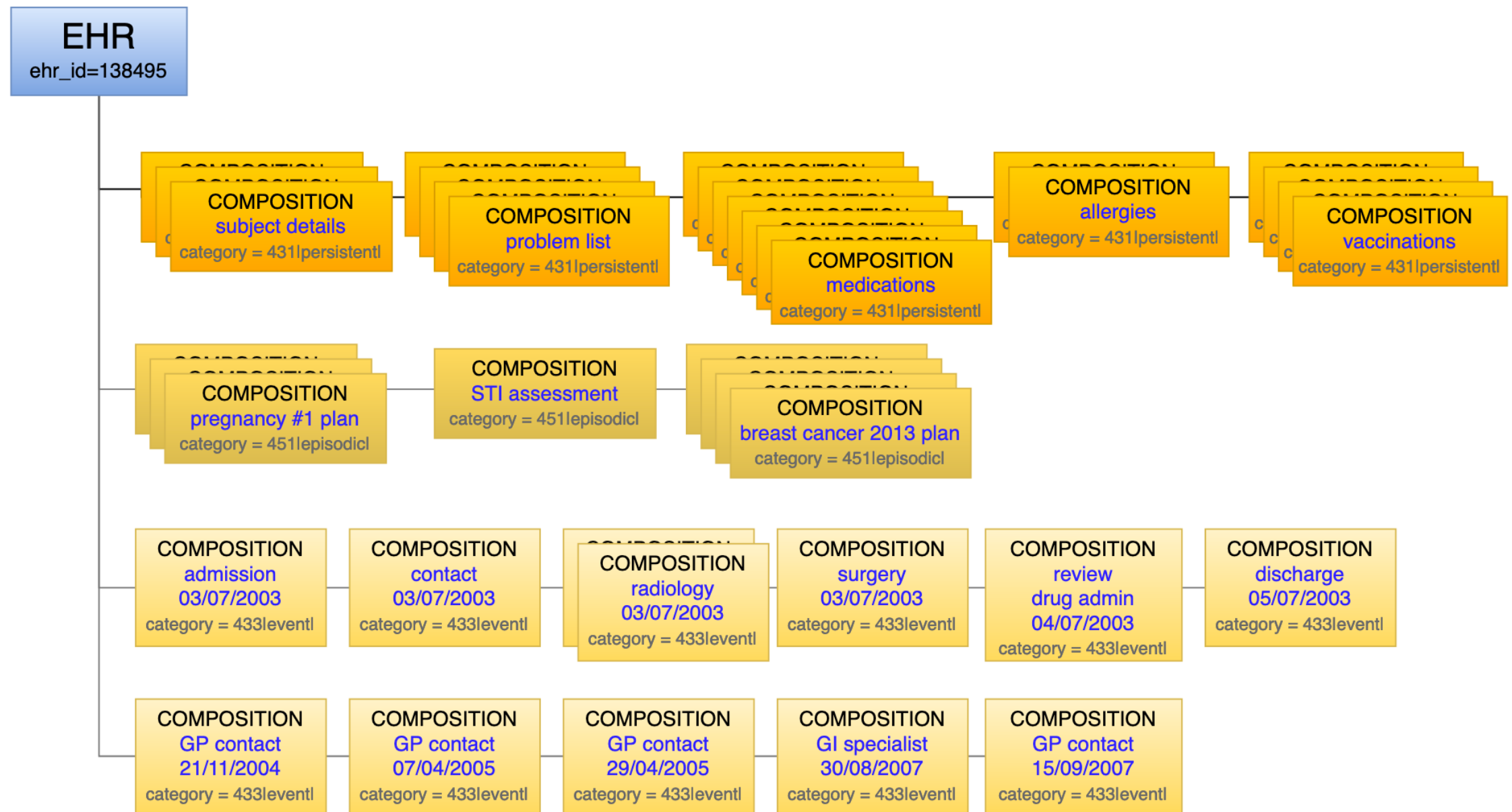
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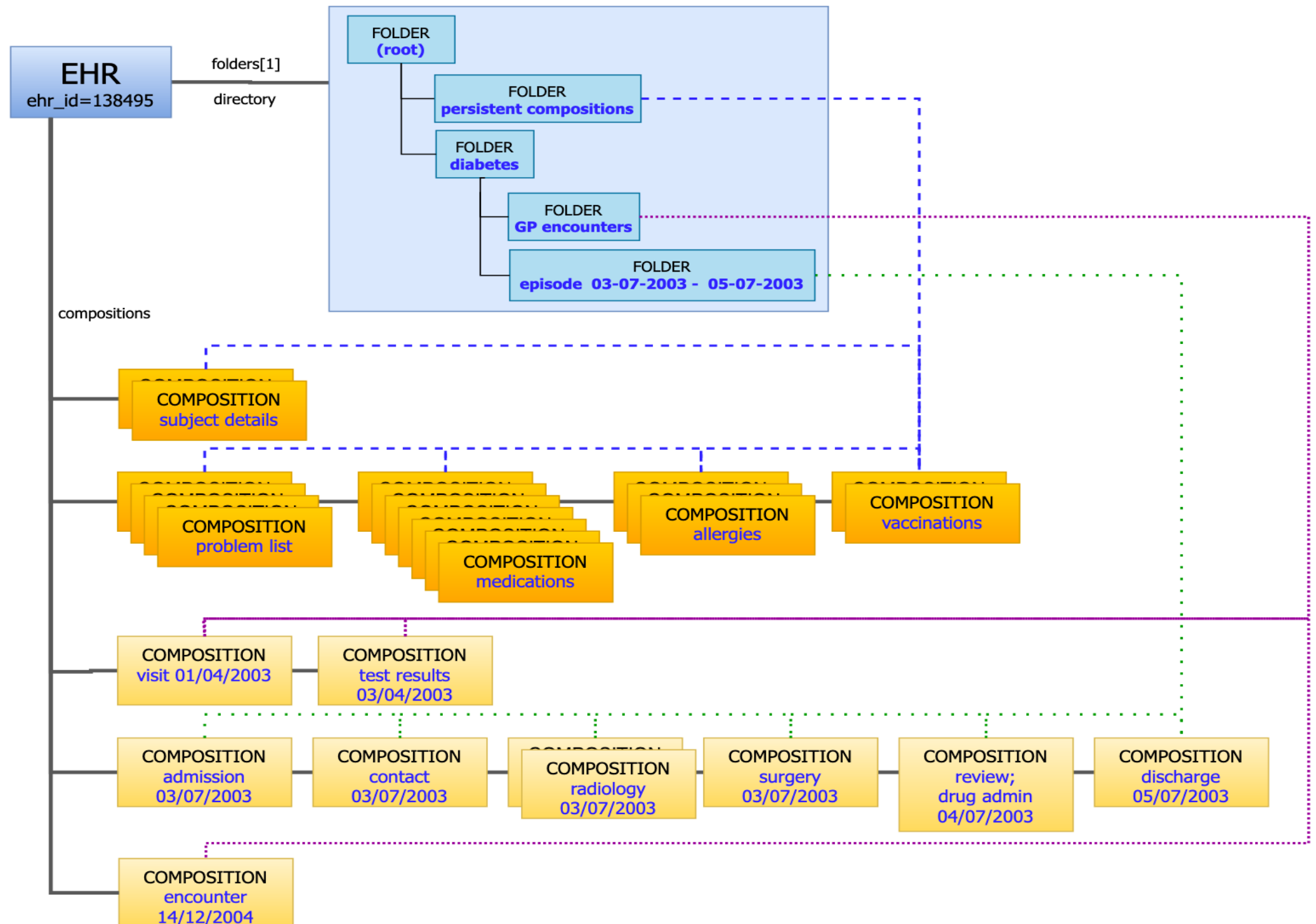
WHAT IS THE OpenEHR?

Links

- Most of the relationships between different Entries and Elements is defined in archetypes and templates, generally in the same Composition
- Links allow the system developer to connect different Entries which do not have a 'pre-cooked' association, and where the Entries live in different Compositions

WHAT IS THE OpenEHR?

Links example



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Table 1 – Problems identified with Clinical Data Sets (CDS) and their OpenEHR Solutions

	Problems with CDS	Solutions with OpenEHR
1	Basic Data Types	Reference Model
2	Presentation Formats	Existing tools based on OpenEHR guidelines.
3	Design principles	Archetypes is a predefined structure.
4	Time of data capture	Archetypes have support for defining time-series.
5	Interpretation of data	Relevant archetypes have all relevant information for the interpretation of a measurement.
6	Integrity constraints	Archetypes are used to define integrity constraints in a uniform way.
7	Replication of domain knowledge	Making archetypes freely available at one central place is another mechanism to avoid 'reinventing the wheel'.
8	Multi-language support	Any translation occurs within one archetype only.
9	Non-integrated specialist applications	Archetypes can be shared by multiple HIS and authorities. Information can be exchanged between different systems keeping the semantic meaning.

Source: Expressing clinical data sets with openEHR archetypes: A solid basis for ubiquitous computing - Shelly Sachdeva, Shivani Batra, Subhash Bhalla

OpenEHR as a Solution

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Main Goals

- 🎯 Develop a New Clinical Model to support the EHR
- 🎯 Ensure Structured Data
- 🎯 Improve of the information exchange between HIS
- 🎯 Promote Interoperability at its different levels
- 🎯 Generate new Relevant Knowledge
- 🎯 Ensure knowledge-based activities - Decision Support Systems
- 🎯 Consult the complete EHR of the patient, in real time

Lifelong

Longitudinal

Computable

Secure

Sharable

New Healthcare System Features

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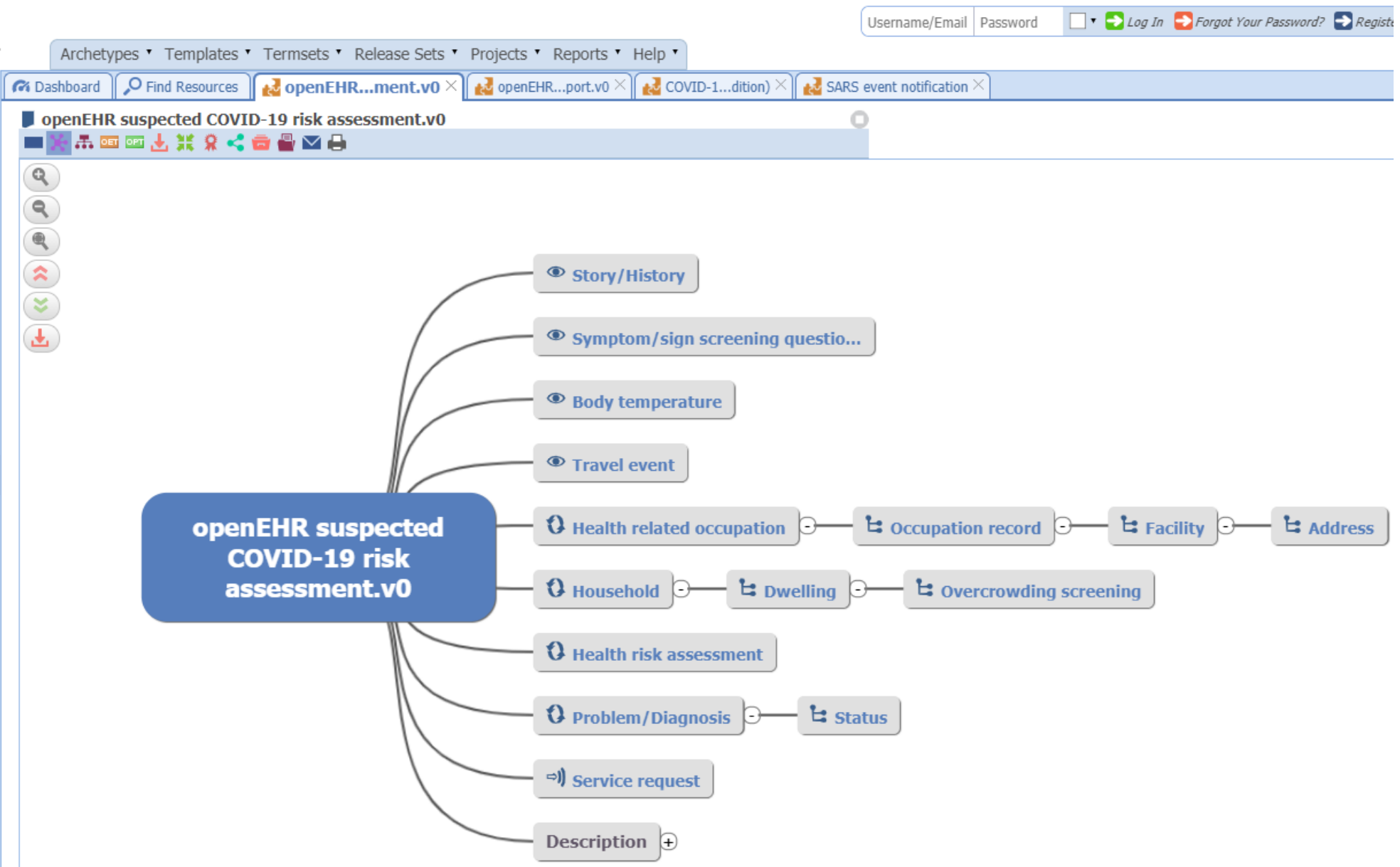
openEHR Clinical Knowledge Manager

Subdomain: All subdomains
Project / incubator: All projects
Active Under review Published

Templates

- ✦ EHR Templates
 - Cluster
 - Composition
 - Antenatal - first visit
 - AU COVID-19 Likelihood
 - COVID-19 Pneumonia D
 - Demo with hide-on-form
 - EAR Primary Hip Arthro
 - EAR Revision Hip Arthr
 - ePrescription (epSoS/Cc
 - ePrescription (FHIR)
 - eReferral
 - Examination archetypes
 - GECCO core
 - Generic Laboratory Test
 - Heart Failure Clinic First
 - International Patient Su
 - Laboratory panel report
 - Molecular Pathology Rej
 - NCD - first visit
 - openEHR confirmed CO
 - openEHR suspected CO
 - SARS event notification
 - Slovenia RFS Primarv H

Projects & Incubators
New and Modified Resources



Source: <https://ckm.openehr.org/ckm/>

Archetype Designer

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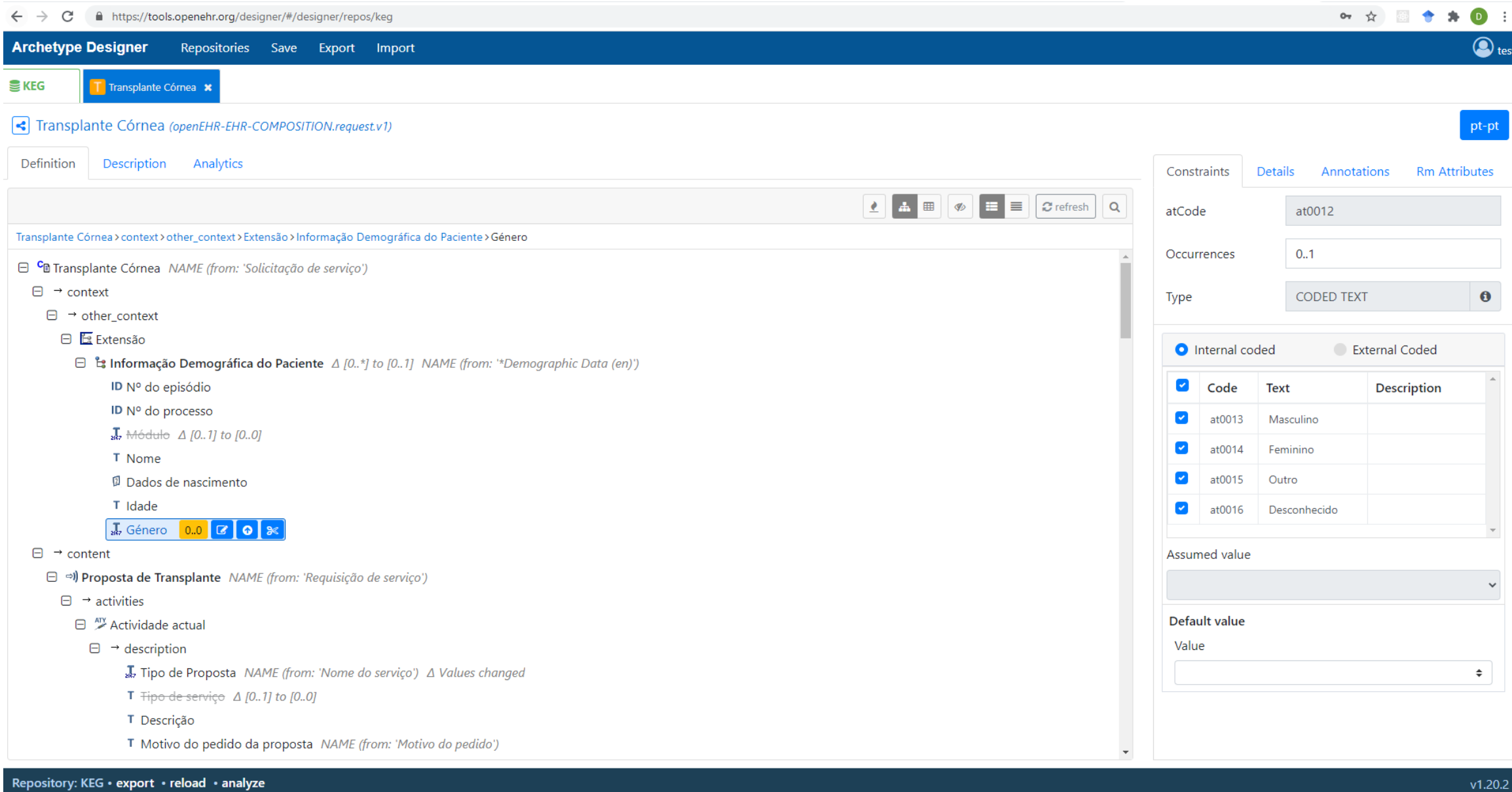
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The screenshot shows the Archetype Designer web application interface. The browser address bar displays <https://tools.openehr.org/designer/#/designer/repos/keg>. The application title is "Archetype Designer" with navigation options: Repositories, Save, Export, Import. A user profile "test" is visible in the top right.

The main workspace shows a tree view of the archetype structure for "Transplante Córnea". The selected path is: Transplante Córnea > context > other_context > Extensão > Informação Demográfica do Paciente > Género. The tree view shows the following structure:

- Transplante Córnea NAME (from: 'Solicitação de serviço')
 - context
 - other_context
 - Extensão
 - Informação Demográfica do Paciente Δ [0..*] to [0..1] NAME (from: '*Demographic Data (en)')
 - ID Nº do episódio
 - ID Nº do processo
 - Módulo Δ [0..1] to [0..0]
 - T Nome
 - Dados de nascimento
 - T Idade
 - Género 0..0**

- content
- Proposta de Transplante NAME (from: 'Requisição de serviço')
 - activities
 - Actividade actual
 - description
 - Tipo de Proposta NAME (from: 'Nome do serviço') Δ Values changed
 - Tipo de serviço Δ [0..1] to [0..0]
 - T Descrição
 - Motivo do pedido da proposta NAME (from: 'Motivo do pedido')

The right-hand panel shows configuration options for the selected "Género" archetype. It includes tabs for Constraints, Details, Annotations, and Rm Attributes. The "Details" tab is active, showing:

- atCode: at0012
- Occurrences: 0..1
- Type: CODED TEXT
- Internal coded (selected) / External Coded
- Table of internal codes:

Code	Text	Description
at0013	Masculino	
at0014	Feminino	
at0015	Outro	
at0016	Desconhecido	

Below the table are fields for "Assumed value" and "Default value".

The footer of the application shows "Repository: KEG • export • reload • analyze" and the version "v1.20.2".

Source: <https://tools.openehr.org/designer/#/designer/repos/keg>

Archetype Designer

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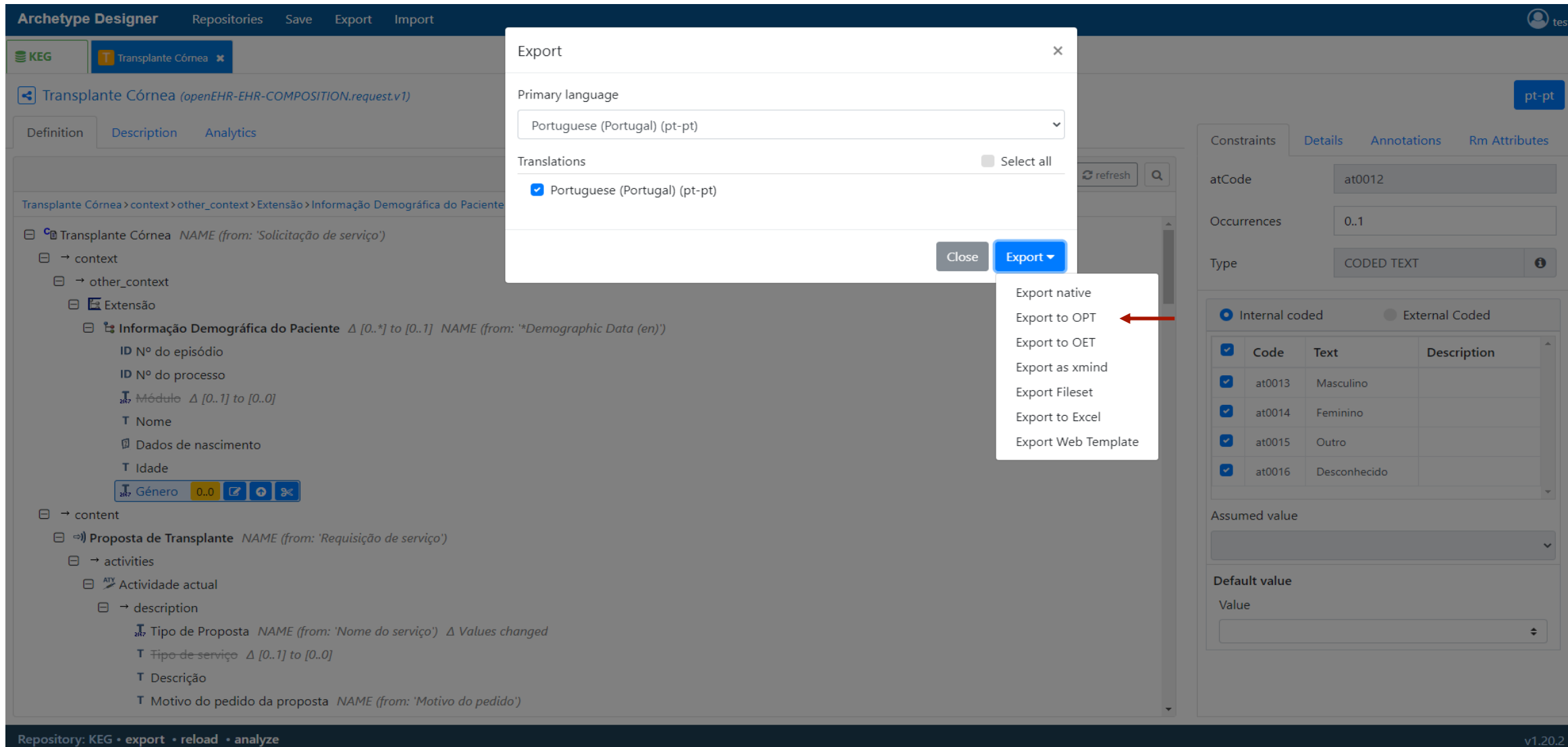
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The screenshot shows the Archetype Designer interface with the 'Export' dialog box open. The dialog box has a 'Primary language' dropdown set to 'Portuguese (Portugal) (pt-pt)' and a 'Translations' section with a checked checkbox for 'Portuguese (Portugal) (pt-pt)'. The 'Export' button is highlighted, and a dropdown menu is visible with the following options: 'Export native', 'Export to OPT' (highlighted with a red arrow), 'Export to OET', 'Export as xmind', 'Export Fileset', 'Export to Excel', and 'Export Web Template'. The background interface shows a tree view of the archetype structure and a details panel on the right.

Source: <https://tools.openehr.org/designer/#/designer/repos/keg>



OPT FORMAT

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```
1 <?xml version="1.0" encoding="UTF-8" standalone="yes"?>
2 <template xmlns="http://schemas.openehr.org/v1">
3   <language>
8   </language>
9   <description>
32  </description>
33  <uid>
34    <value>9a5c8f5b-ebe8-49e6-a272-33625bb2a289</value>
35  </uid>
36  <template_id>
37    <value>Transplante Córnea</value>
38  </template_id>
39  <concept>Transplante Córnea</concept>
40  <definition>
41    <rm_type_name>COMPOSITION</rm_type_name>
42    <occurrences>
49    </occurrences>
50    <node_id>at0000</node_id>
51    <attributes xsi:type="C_SINGLE_ATTRIBUTE" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
102  </attributes>
103  <attributes xsi:type="C_SINGLE_ATTRIBUTE" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
557  </attributes>
558  <attributes xsi:type="C_MULTIPLE_ATTRIBUTE" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
6052  </attributes>
6053  <archetype_id>
6054    <value>openEHR-EHR-COMPOSITION.request.v1</value>
6055  </archetype_id>
6056  <template_id>
6057    <value>Transplante Córnea</value>
6058  </template_id>
6059  <term_definitions code="at0000">
6060    <items id="text">Transplante Córnea</items>
6061    <items id="description">Documento enviado de um prestador de cuidados de saúde ou organização para outro, com a finalidade de solicitar aconselhamento, um serviço ou transferência de
assistência. </items>
6062  </term_definitions>
6063  <term_definitions code="at0001">
6064    <items id="text">Tree</items>
6065    <items id="description">@ internal @</items>
6066  </term_definitions>
6067  <term_definitions code="at0042">
6068    <items id="text">Extensão</items>
6069    <items id="description">Informações adicionais necessárias para obter conteúdo local ou para alinhar com outros modelos / formalismos de referência.</items>
6070    <items id="comment">*For example: Local hospital departmental information or additional metadata to align with FHIR or CIMI equivalents. (en)</items>
6071  </term_definitions>
6072  </definition>
6073  <constraints>
6074    <attributes>
6088    </attributes>
6089  </constraints>
6090 </template>
6091
```

Form Builder (AINDA EHR)

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AIDA EHR

Iniciar Sessão

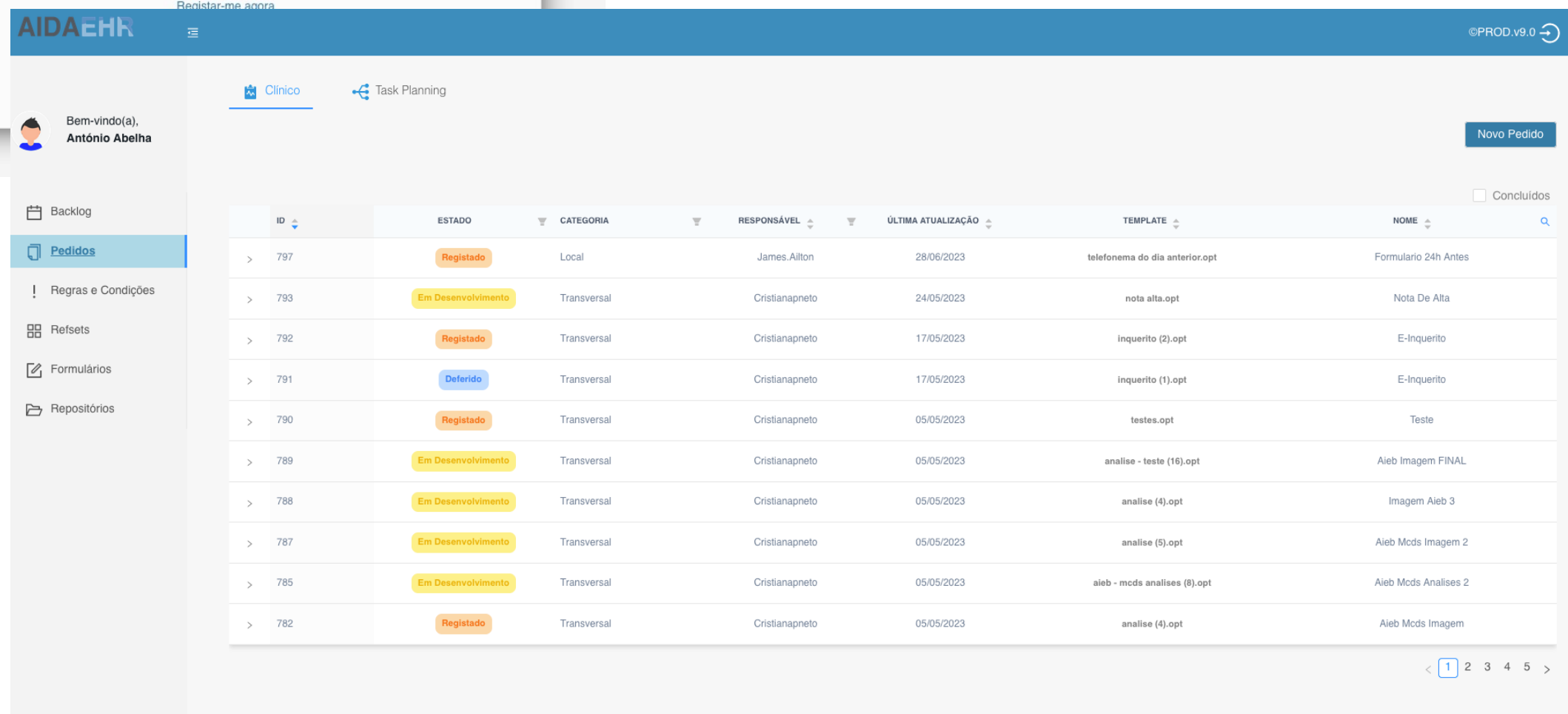
E-mail

Palavra-passe

[Esqueci-me da minha palavra-passe](#)

Entrar

[Registar-me agora](#)



AIDA EHR ©PROD.v9.0

Bem-vindo(a), **António Abelha**

Clínico Task Planning

Novo Pedido

Concluídos

ID	ESTADO	CATEGORIA	RESPONSÁVEL	ÚLTIMA ATUALIZAÇÃO	TEMPLATE	NOME
> 797	Registado	Local	James.Ailton	28/06/2023	telefonema do dia anterior.opt	Formulario 24h Antes
> 793	Em Desenvolvimento	Transversal	Cristianapneto	24/05/2023	nota alta.opt	Nota De Alta
> 792	Registado	Transversal	Cristianapneto	17/05/2023	inquerito (2).opt	E-Inquerito
> 791	Deferido	Transversal	Cristianapneto	17/05/2023	inquerito (1).opt	E-Inquerito
> 790	Registado	Transversal	Cristianapneto	05/05/2023	testes.opt	Teste
> 789	Em Desenvolvimento	Transversal	Cristianapneto	05/05/2023	analise - teste (16).opt	Aieb Imagem FINAL
> 788	Em Desenvolvimento	Transversal	Cristianapneto	05/05/2023	analise (4).opt	Imagem Aieb 3
> 787	Em Desenvolvimento	Transversal	Cristianapneto	05/05/2023	analise (5).opt	Aieb Mcds Imagem 2
> 785	Em Desenvolvimento	Transversal	Cristianapneto	05/05/2023	aieb - mcds analises (8).opt	Aieb Mcds Analises 2
> 782	Registado	Transversal	Cristianapneto	05/05/2023	analise (4).opt	Aieb Mcds Imagem

< 1 2 3 4 5 >

Form Builder (AINDA EHR)

INTRODUCTION

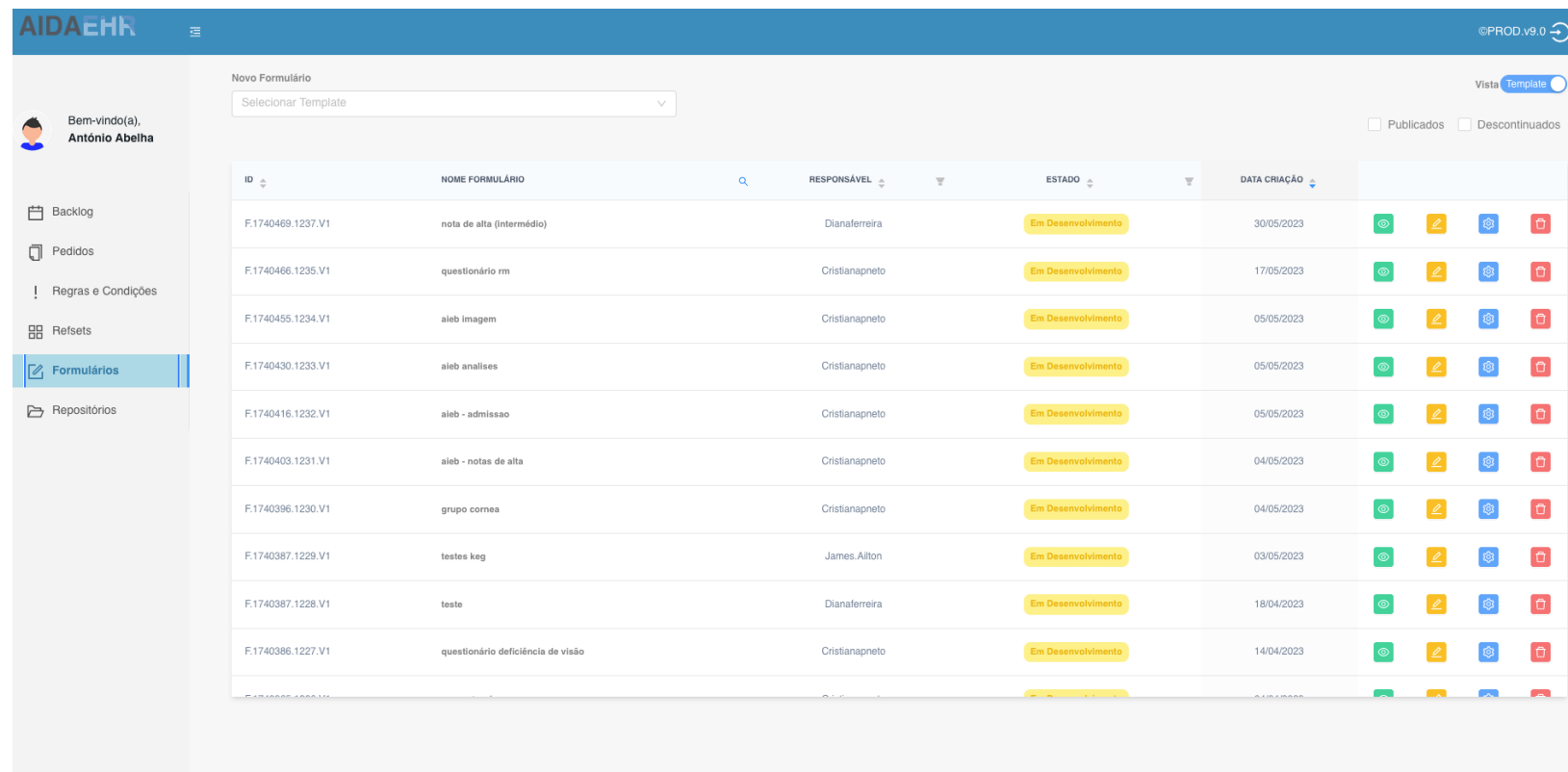
OpenEHR

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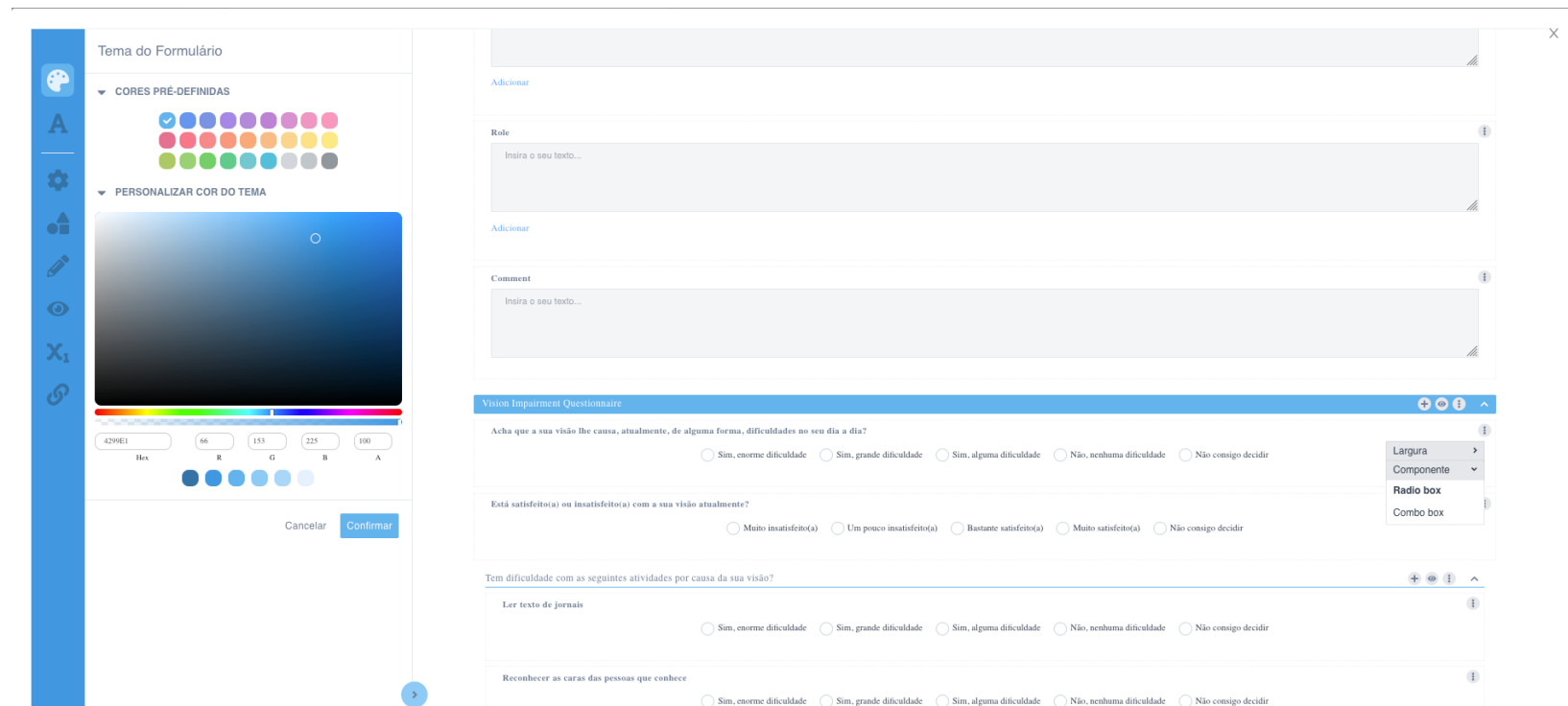
Novo Formulário

Selecionar Template

Vista **Template**

Publicados Descontinuados

ID	NOME FORMULÁRIO	RESPONSÁVEL	ESTADO	DATA CRIAÇÃO	
F.1740469.1237.V1	nota de alta (intermédio)	Dianaferreira	Em Desenvolvimento	30/05/2023	
F.1740466.1235.V1	questionário rm	Cristianapneto	Em Desenvolvimento	17/05/2023	
F.1740455.1234.V1	aleb imagem	Cristianapneto	Em Desenvolvimento	05/05/2023	
F.1740430.1233.V1	aleb analises	Cristianapneto	Em Desenvolvimento	05/05/2023	
F.1740416.1232.V1	aleb - admissao	Cristianapneto	Em Desenvolvimento	05/05/2023	
F.1740403.1231.V1	aleb - notas de alta	Cristianapneto	Em Desenvolvimento	04/05/2023	
F.1740396.1230.V1	grupo cornea	Cristianapneto	Em Desenvolvimento	04/05/2023	
F.1740387.1229.V1	testes keg	James.Ailton	Em Desenvolvimento	03/05/2023	
F.1740387.1228.V1	teste	Dianaferreira	Em Desenvolvimento	18/04/2023	
F.1740386.1227.V1	questionário deficiência de visão	Cristianapneto	Em Desenvolvimento	14/04/2023	



Tema do Formulário

CORES PRÉ-DEFINIDAS

PERSONALIZAR COR DO TEMA

429E1 66 153 225 100
Hex R G B A

Cancelar Confirmar

Adicionar

Role

Inserir o seu texto...

Adicionar

Comment

Inserir o seu texto...

Visual Impairment Questionnaire

Acha que a sua visão lhe causa, atualmente, de alguma forma, dificuldades no seu dia a dia?

Sim, enorme dificuldade Sim, grande dificuldade Sim, alguma dificuldade Não, nenhuma dificuldade Não consigo decidir

Está satisfeito(a) ou insatisfeito(a) com a sua visão atualmente?

Muito insatisfeito(a) Um pouco insatisfeito(a) Bastante satisfeito(a) Muito satisfeito(a) Não consigo decidir

Tem dificuldade com as seguintes atividades por causa da sua visão?

Ler texto de jornais

Sim, enorme dificuldade Sim, grande dificuldade Sim, alguma dificuldade Não, nenhuma dificuldade Não consigo decidir

Reconhecer as caras das pessoas que conhece

Sim, enorme dificuldade Sim, grande dificuldade Sim, alguma dificuldade Não, nenhuma dificuldade Não consigo decidir

Form Builder (AINDA EHR)

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Configurar componente

COMPONENTE

- Input simples
- Área de texto
- Editor de texto

Cancelar Confirmar

Adicionar

Role

Insira o seu texto...

Adicionar

Comment

Insira o seu texto...

Visão Impairment Questionnaire

Acha que a sua visão lhe causa, atualmente, de alguma forma, dificuldades no seu dia a dia?

Sim, enorme dificuldade Sim, grande dificuldade Sim, alguma dificuldade Não, nenhuma dificuldade Não consigo decidir

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Sim, enorme dificuldade Sim, grande dificuldade Sim, alguma dificuldade Não, nenhuma dificuldade Não consigo decidir

Reconhecer as caras das pessoas que conhece

Sim, enorme dificuldade Sim, grande dificuldade Sim, alguma dificuldade Não, nenhuma dificuldade Não consigo decidir

Questionário Deficiência de Visão

Imprimir Formulário

Colapsar Formulário

Mostrar Cabeçalho

Acha que a sua visão lhe causa, atualmente, de alguma forma, dificuldades no seu dia a dia?

Sim, enorme dificuldade
 Sim, grande dificuldade
 Sim, alguma dificuldade
 Não, nenhuma dificuldade
 Não consigo decidir

Está satisfeito(a) ou insatisfeito(a) com a sua visão atualmente?

Muito insatisfeito(a) Um pouco insatisfeito(a)
 Bastante satisfeito(a) Muito satisfeito(a)
 Não consigo decidir

Tem dificuldade com as seguintes atividades por causa da sua visão?

Ler texto de jornais

Sim, enorme dificuldade
 Sim, grande dificuldade
 Sim, alguma dificuldade
 Não, nenhuma dificuldade
 Não consigo decidir

Reconhecer as caras das pessoas que conhece

Sim, enorme dificuldade
 Sim, grande dificuldade
 Sim, alguma dificuldade
 Não, nenhuma dificuldade
 Não consigo decidir

Ver os preços das coisas quando anda às compras

Sim, enorme dificuldade

AIDA EHR

Bem-vindo(a), António Abelha

Backlog

Pedidos

Regras e Condições

Refsets

Formulários

Repositórios

Refsets

openEHR

Formulários

Refsets Locais CHUP

- Tipificar Alertas (TASK PLANNING)
- Proveniências (SONHO)
- Diagnosticos (ICD10)
- teste (TESTE)
- Mapeamento Value set Admissão (SNOMEDCT)
- Prioridade admissão Hospitalar (SNOMEDCT)
- Alertas (SNOMEDCT)
- teste (SNOMEDCT)
- teste1 (QUERY TESTE)
- teste1 (QUERY TESTE)

OpenEHR Industry Partners

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Source:
https://www.openehr.org/community/industry_partners/

SYSTEM ARCHITECTURE

INTRODUCTION

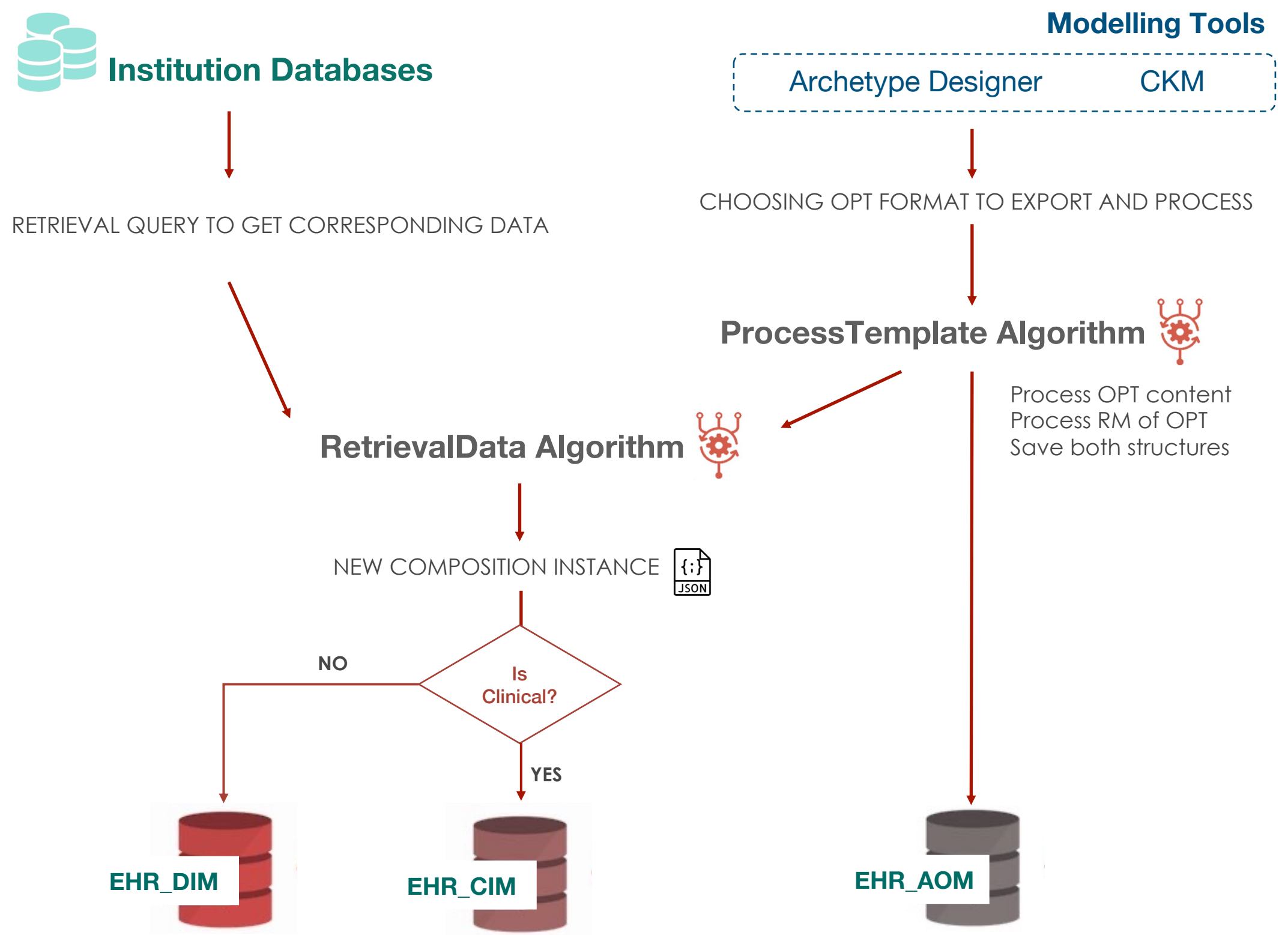
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Archetypes and Templates

Forms to represent the Templates

AQL motor

System Based On OpenEHR

Refsets of Data

Guidelines CDS

Terminologies

Task Planning Processes

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PUBLICATIONS

- Daniela Oliveira. Rui Miranda. Nuno Abreu. Pedro Leuschner. António Abelha. Manuel Santos and José Machado. Management of a Pandemic Based on an openEHR approach. in *Procedia Computer Science*. Elsevier. 177. 2020
- Daniela Oliveira. Rui Miranda. Nuno Abreu. Pedro Leuschner. António Abelha and José Machado. Steps towards an Healthcare Information Model based on openEHR. In *Procedia Computer Science*. HODII. Elsevier. 2021 (Accepted)
- Daniela Oliveira. Rui Miranda. Pedro Leuschner. Nuno Abreu. Manuel Filipe Santos. Antonio Abelha and José Machado. OpenEHR modeling: improving clinical records during the COVID-19 pandemic. in *Health and Technology*. Springer Nature. 2021 (Accepted)
- Francini Hak, Daniela Oliveira, Nuno Abreu, Pedro Leuschner, António Abelha, Manuel Santos, An OpenEHR Adoption in a Portuguese Healthcare Facility, *Procedia Computer Science*, Volume 170,2020, Pages 1047-1052 (<https://doi.org/10.1016/j.procs.2020.03.075>)
- Daniela Oliveira, Ana Coimbra, Filipe Miranda, Nuno Abreu, Pedro Leuschner, José Machado and António Abelha, Step Towards OpenEHR in a Portuguese Healthcare facility, in *Advances in Intelligent Systems and Computing*, Volume 747, Springer, 2018.



Universidade do Minho
Escola de Engenharia

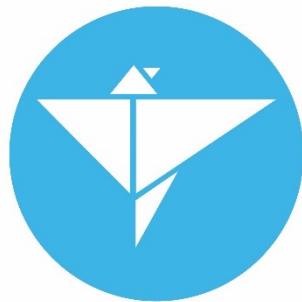


KEG
Knowledge Engineering Group



CENTROALGORITMI

OpenEHR - The solution for an interoperable development



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E TECNOLOGIA
UNIVERSIDADE DOS AÇORES



THANK YOU!

António Abelha

May, 5th, 2021

Requisitos para uma implementação

RQ1 – Como modelar/criar estruturas OpenEHR?

1. Open EHR Modelling

- Better Platform
- CKM Repository

Requisitos para uma implementação

RQ2 – Como utilizar estruturas OpenEHR?

2. Process OPT Algorithm -> nodejs

- Processa o .opt
- Processa todo o RM associado
- Armazena estrutura numa document store database (SODA - Oracle 12c)

Requisitos para uma implementação

RQ3 – Como reutilizar estruturas OpenEHR?

3. FormBuilder Platform

- A partir de um template permite criar novas estruturas e diferentes formularios

Requisitos para uma implementação

RQ4 – Como aceder à informação guardada em estruturas OpenEHR?

4. AIDAEHR information Model (API)

- Submissão, edição de composições.

Requisitos para uma implementação

RQ5 – Como migrar sistemas legados para estruturas OpenEHR?

5. RetrievalData Algoritm

-> carregamento de mapeamentos

Requisitos para uma implementação

RQ6 – Qual a estrutura de dados para estruturas OpenEHR?

6. Separação de modelos de informação

-> DIM – modelo demográfico

-> CIM – EHR modelo

Requisitos para uma implementação

RQ7 – Qual o paradigma dados para estruturas OpenEHR?

7. Document Store Database

-> SODA – Oracle 12c

-> SODA – Oracle 19 (Task Plan Engine)

Requisitos para uma implementação

RQ8 – Terminologias e Ontologias vs OpenEHR?

8. Criação de refsets por query ou estáticos para utilização em `coded_texts` e `external codes`