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OpenEHR Overview

(two level modelling)

→ Information Model



OpenEHR Overview

(two level modelling)

- Information Model
 - Reference Model



OpenEHR Overview

(two level modelling)

- Information Model
 - Reference Model
 - Clinical Information



OpenEHR Overview

(two level modelling)

- Information Model
 - Reference Model
 - Clinical Content Model
 - Archetypes



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OpenEHR Reference Model

OpenEHR Overview (ECO System)

The diagram illustrates the OpenEHR ECO System architecture. At the center is a stack of green boxes labeled "Archetypes". Arrows point from "Archetypes" to several other components:

- An arrow points from "Archetypes" to a blue box labeled "Reference Model".
- An arrow points from "Archetypes" to a stack of grey boxes labeled "Code Skeletons".
- An arrow points from "Archetypes" to a stack of grey boxes labeled "Terminology mappings".
- An arrow points from "Archetypes" to a stack of blue boxes labeled "Queries".
- An arrow points from "Archetypes" to a stack of green boxes labeled "Templates".
- An arrow points from "Templates" to a stack of grey boxes labeled "Code Skeletons".
- An arrow points from "Templates" to a stack of grey boxes labeled "Data Sets".
- An arrow points from "Templates" to a grey box labeled "XML schemas".
- An arrow points from "Templates" to a grey box labeled "UI Forms".
- An arrow points from "Templates" to a grey box labeled "Messages".
- An arrow points from "Templates" to a grey box labeled "display HTML".
- An arrow points from "Templates" to another grey box labeled "display HTML".

A blue stick figure is positioned on the right side of the diagram.

Don 100%

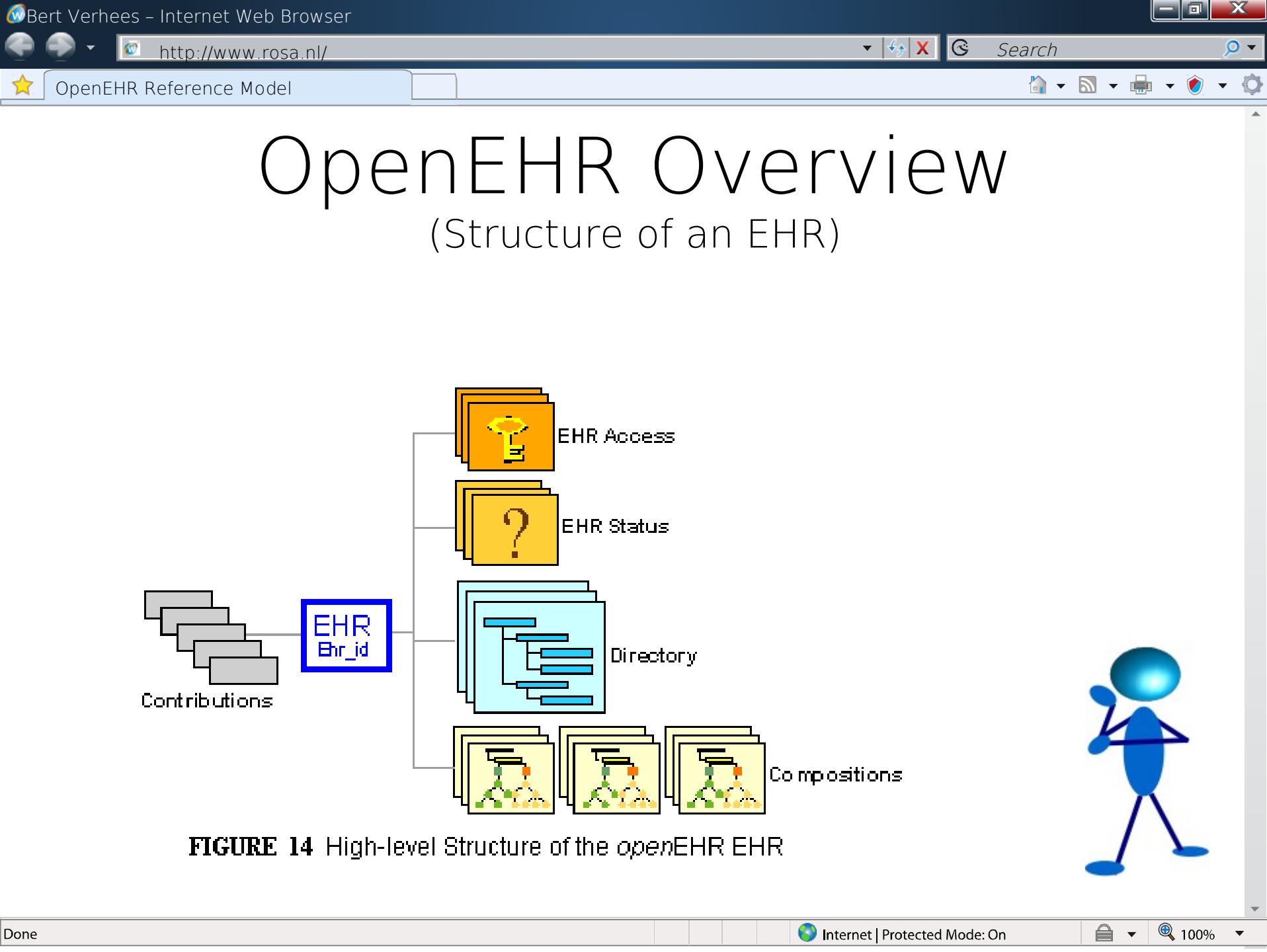
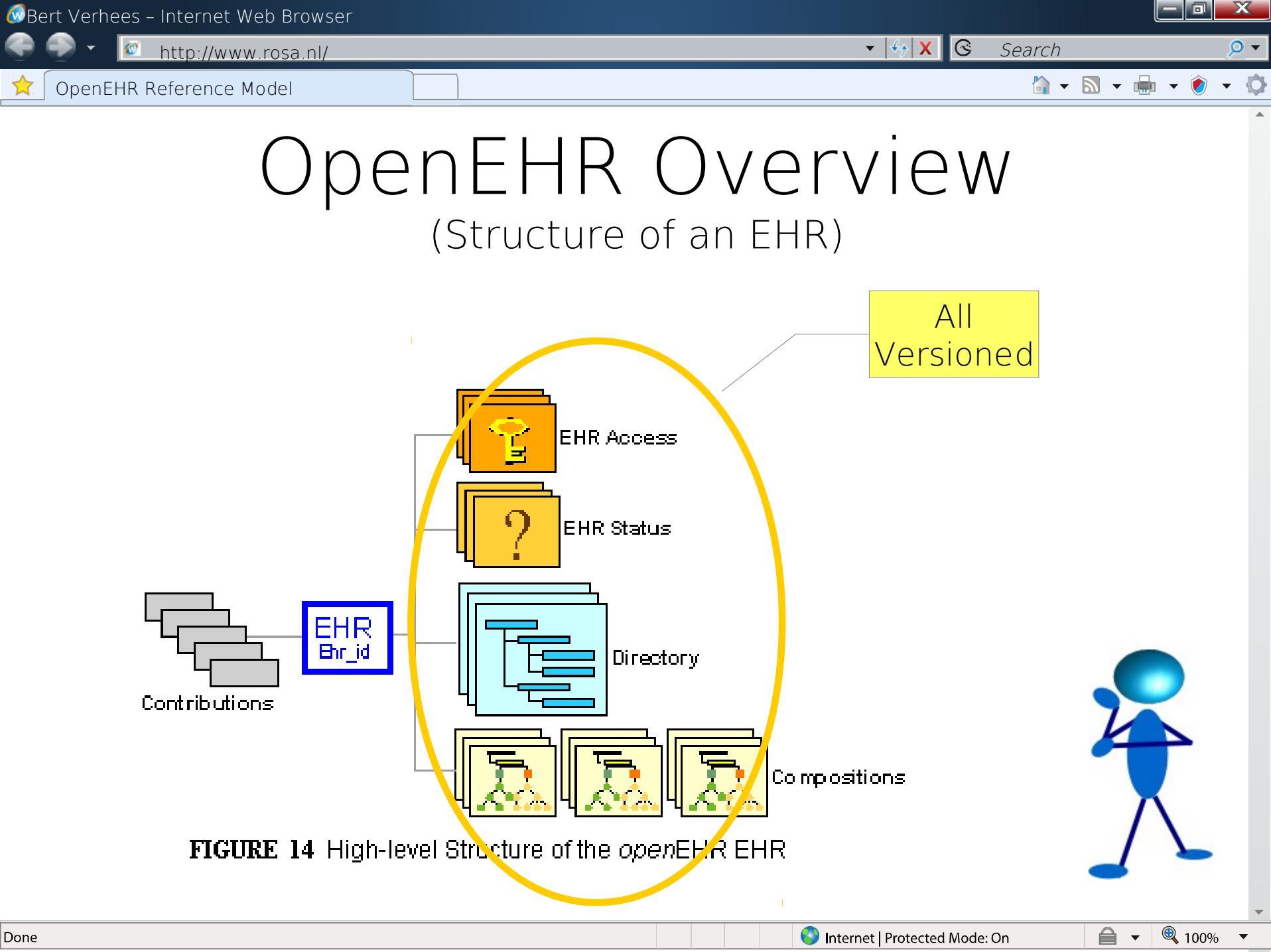


FIGURE 14 High-level Structure of the *openEHR* EHR



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OpenEHR Reference Model

OpenEHR Overview

(Software Structure)

The diagram illustrates the software structure of OpenEHR, organized into several layers:

- Top Layer:** Four services represented as colored boxes: Archetype SVC (green), Term svc (pink), EHR svc (brown), and Demo. SVC (dark green).
- Second Layer:** A horizontal bar divided into four segments: Template OM (green), Archetype OM (purple), EHR (red), and Demographic (dark green).
- Third Layer:** A purple bar labeled "Common".
- Fourth Layer:** Two white boxes: Data types and Data structures.
- Fifth Layer:** A white box labeled "Basic types (Id, Terminology Access)".
- Bottom Layer:** A dashed-line box labeled "General Purpose Datatypes (ISO 11404)".

A pink arrow points from the text "SM" to the "Demo. SVC" box.

ADL is indicated by a pointer to the "Archetype OM" segment.

A blue stick figure is positioned to the right of the diagram.

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OpenEHR Reference Model

OpenEHR Overview

(Software Structure)

EHR	Clusters
Folders	Elements
Composition	Data values
Sections	
Entries	



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OpenEHR Reference Model

OpenEHR Overview

(Software Structure)

EHR	Clusters
Folders	Elements
Composition	Data values
Sections	
Entries	



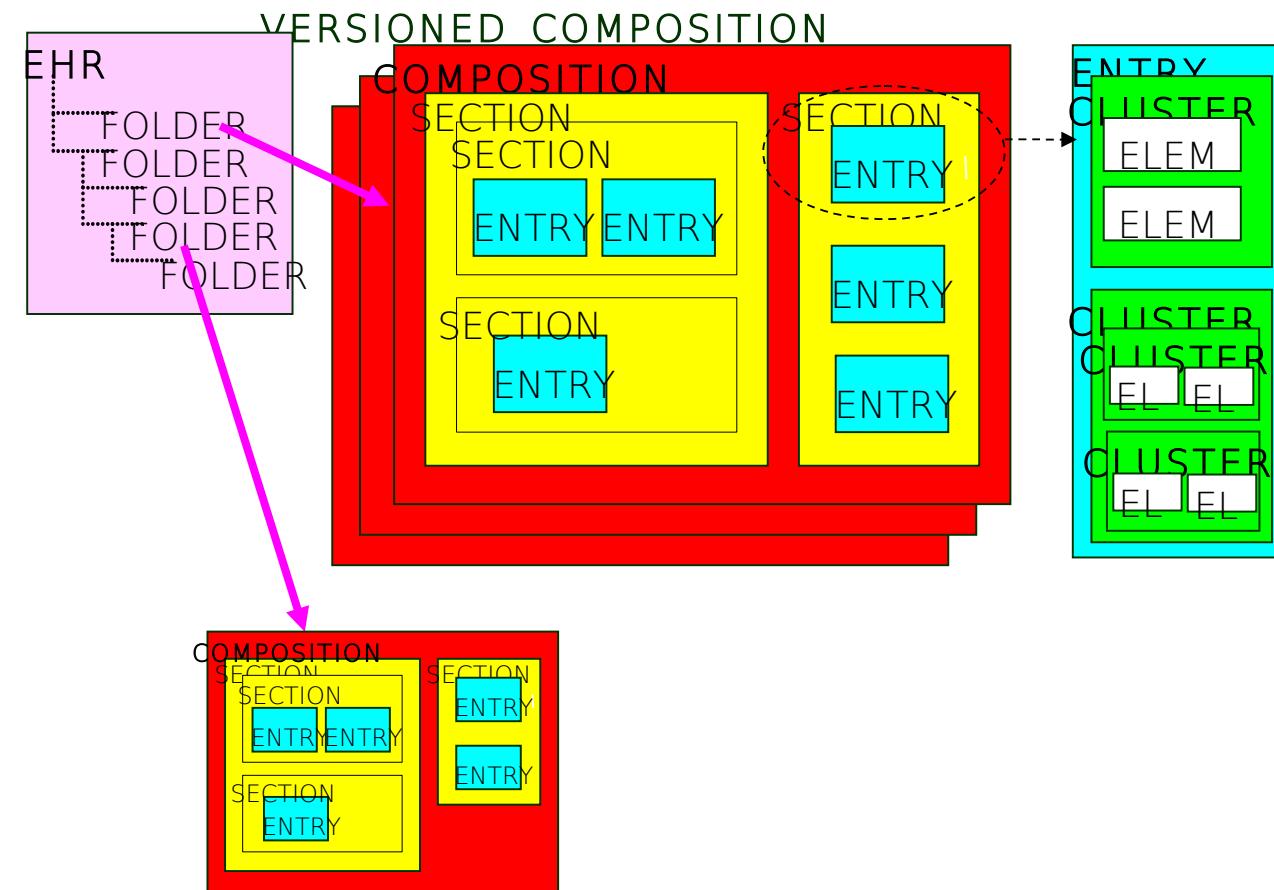
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OpenEHR Overview

(Composition Structure)



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OpenEHR Reference Model

OpenEHR Overview

(Information Level 1 & 2)

The image displays a web browser window with the URL http://www.rosa.nl/. The title bar says "OpenEHR Reference Model". The main content area shows three examples of OpenEHR interfaces:

- Left:** A clinical history and physical examination (H&P) form for "West, Michael". It includes sections for Chief complaint, History of Presenting Problem (e.g., Chest pain), and various clinical findings like Blood pressure and Heart rate.
- Middle:** A "Birth Plan - LDRN RATED" interface for "Archbishop THABAS Thabas 06-Jan-1981 26 years Male". It shows delivery options, feeding preferences, and a history section.
- Right:** A "Diagnosis data" form for a patient with a birth date of 26 April 2007. It includes fields for Diagnosis, Status, Date of initial onset, Clinical description, Location, and Complication of.

Below these interfaces is a "Template Properties" tree diagram:

```

+ [i] Template Properties
  |- Encounter
    |- context
    |- content
      |- Baseline assessment modified: Archetype Name = 'Heading'
        |- items
          |- Maternal examination modified: Archetype Name = 'Heading'
            |- items
              |- Vital signs
                |- items
                  |- Body temperature
                  |- Pulse
                  |- Respiration (v4 draft)
                  |- Blood pressure modified: Archetype Name = 'Blood Pressure'
                  |- Body weight
              |- Examination of abdomen modified: Archetype Name = 'Examination of abdomen'
                |- Any event
                  |- Clinical description
                |- Examination of the abdomen
                  |- Normal statements
                  |- Clinical description
                  |- Findings

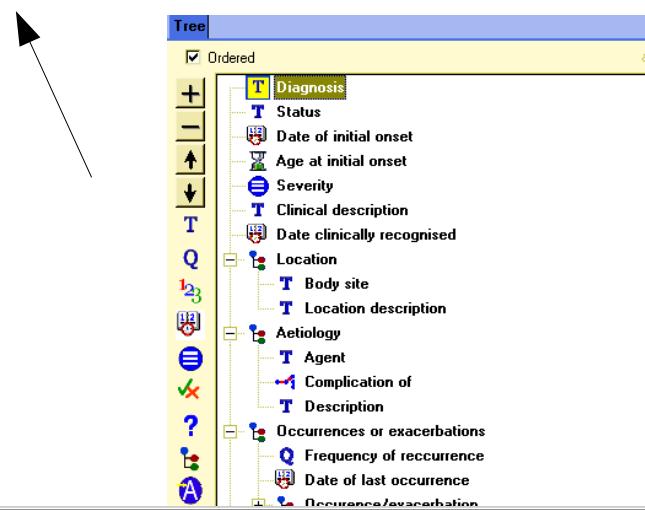
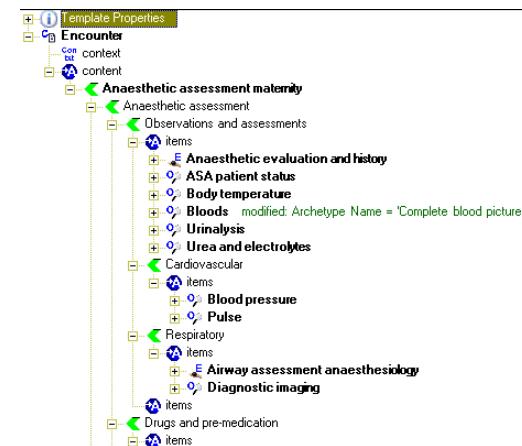
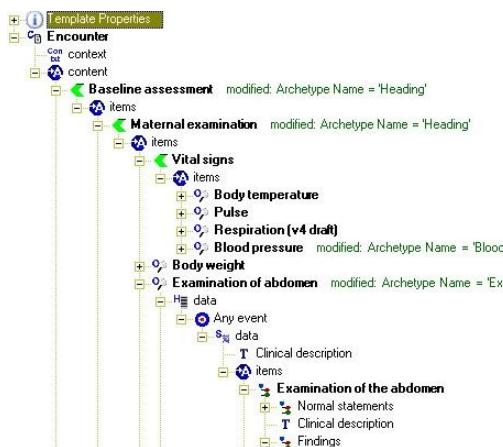
```

To the right of the tree diagram is a blue stick figure holding a sword.

At the bottom left is a "Done" button. At the bottom right are status icons: Internet | Protected Mode: On, a lock icon, a search icon, and a 100% zoom icon.

OpenEHR Overview

(Information Level 2 & 3)





OpenEHR Overview

(Information Level 2 & 3)

Tree

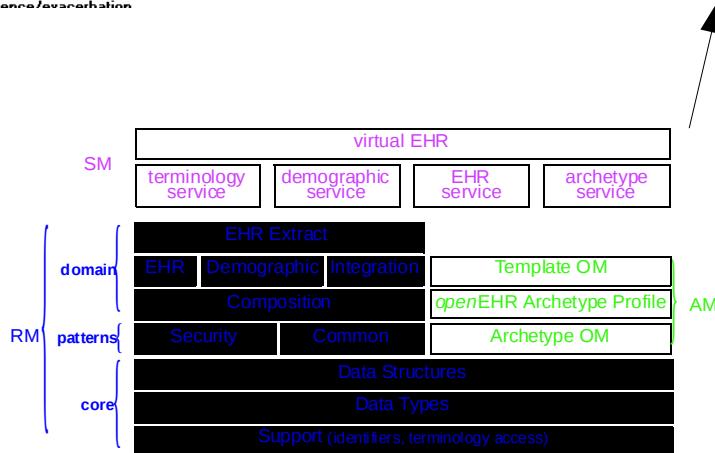
Ordered

- + **T** Diagnosis
 - + **T** Status
 - + Date of initial onset
 - + Age at initial onset
 - + **E** Severity
 - + **T** Clinical description
 - + Date clinically recognised
 - + **L** Location
 - + **T** Body site
 - + **T** Location description
 - + **A** Aetiology
 - + **T** Agent
 - + Complication of
 - + **T** Description
 - + **O** Occurrences or exacerbations
 - + **Q** Frequency of recurrence
 - + Date of last occurrence
 - + Occurrence/exacerbation

Tree **Events**

Ordered

- + **Q** Haemoglobin
 - + **Q** Red cell count (RCC)
 - + **I** Packed cell volume (PCV)
 - + **Q** Mean cell haemoglobin concentration (MCHC)
 - + **Q** Mean cell volume (MCV)
 - + **Q** Mean cell haemoglobin (MCH)
 - + **I** Red cell distribution width (RDW)
 - + **Q** Erythrocyte sedimentation rate (ESR)
 - + **Q** Platelet count
 - + **Q** White cell count
 - + **L** White cell differential
 - + **Q** Mean platelet volume (MPV)
 - + **I** Platelet distribution width
 - + **I** Plateletcrit
 - + **T** Comment
 - + **T** Microscopic features



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OpenEHR Reference Model

OpenEHR Overview (Archetypes)

openEHR-EHR-OBSERVATION.blood_film.v1

Header Definition Terminology Display Interface Description

Protocol Person State with EventSeries

Data Protocol

Data: Event Series Person State

Tree Events

Ordered

+ - ↑ ↓ T Q 1 2 3 4 5 6 7 8 9 A

Haemoglobin
Red cell count (RCC)
Packed cell volume (PCV)
Mean cell haemoglobin concentration (MCHC)
Mean cell volume (MCV)
Mean cell haemoglobin (MCH)
Red cell distribution width (RDW)
Erythrocyte sedimentation rate (ESR)
Platelet count
White cell count
White cell differential
Mean platelet volume (MPV)
Platelet distribution width
Plateletcrit
Comment
Microscopic features

Constraint Details

Occurrences

Min: 0 Max: 1 Unbounded

Description: The mass concentration of haemoglobin

Runtime name constraint:

Quantity

Property: Concentration

Units: gm/l

Count

Limit decimal places

Set min. value >= 0.000

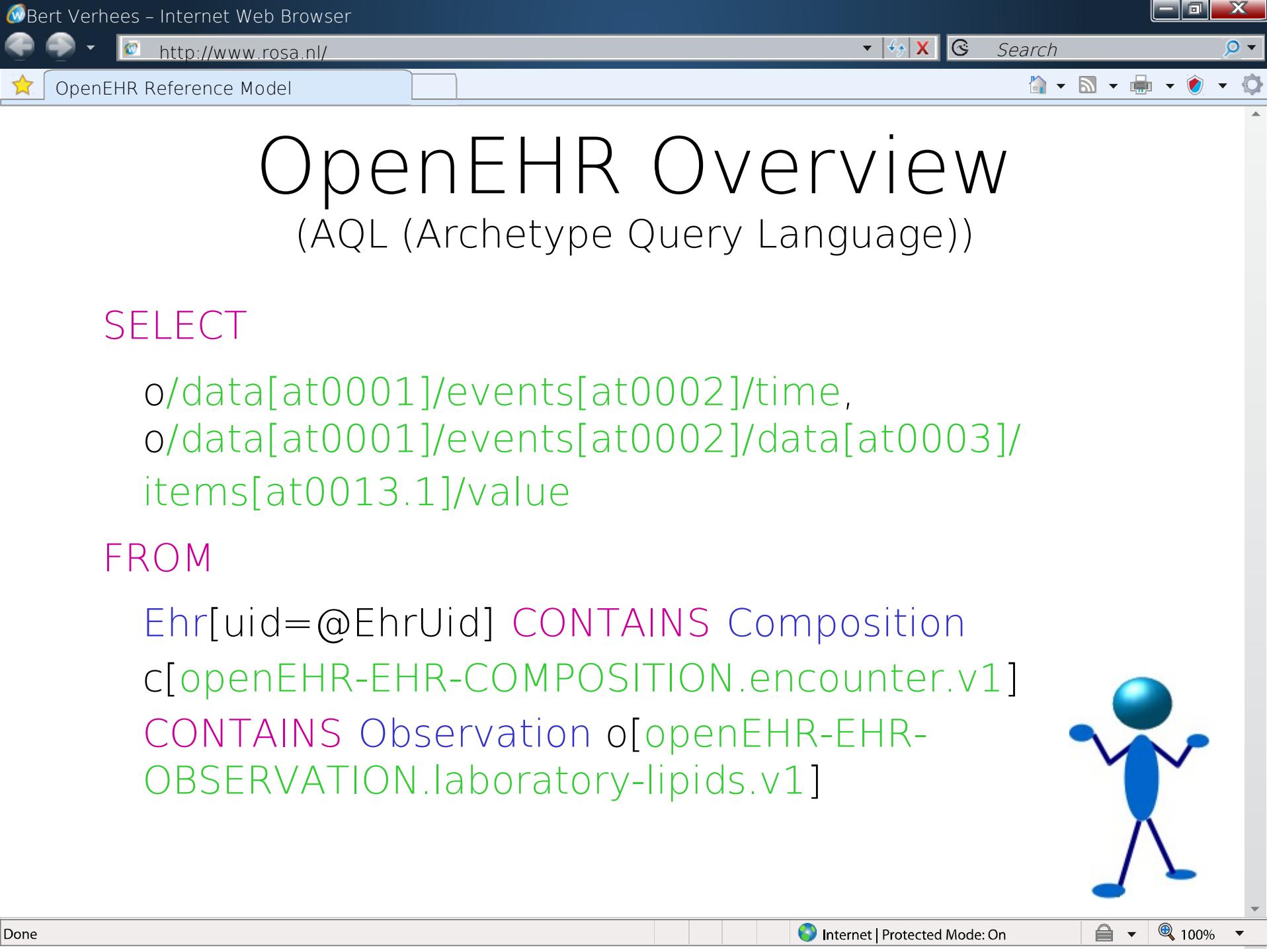
Set max. value

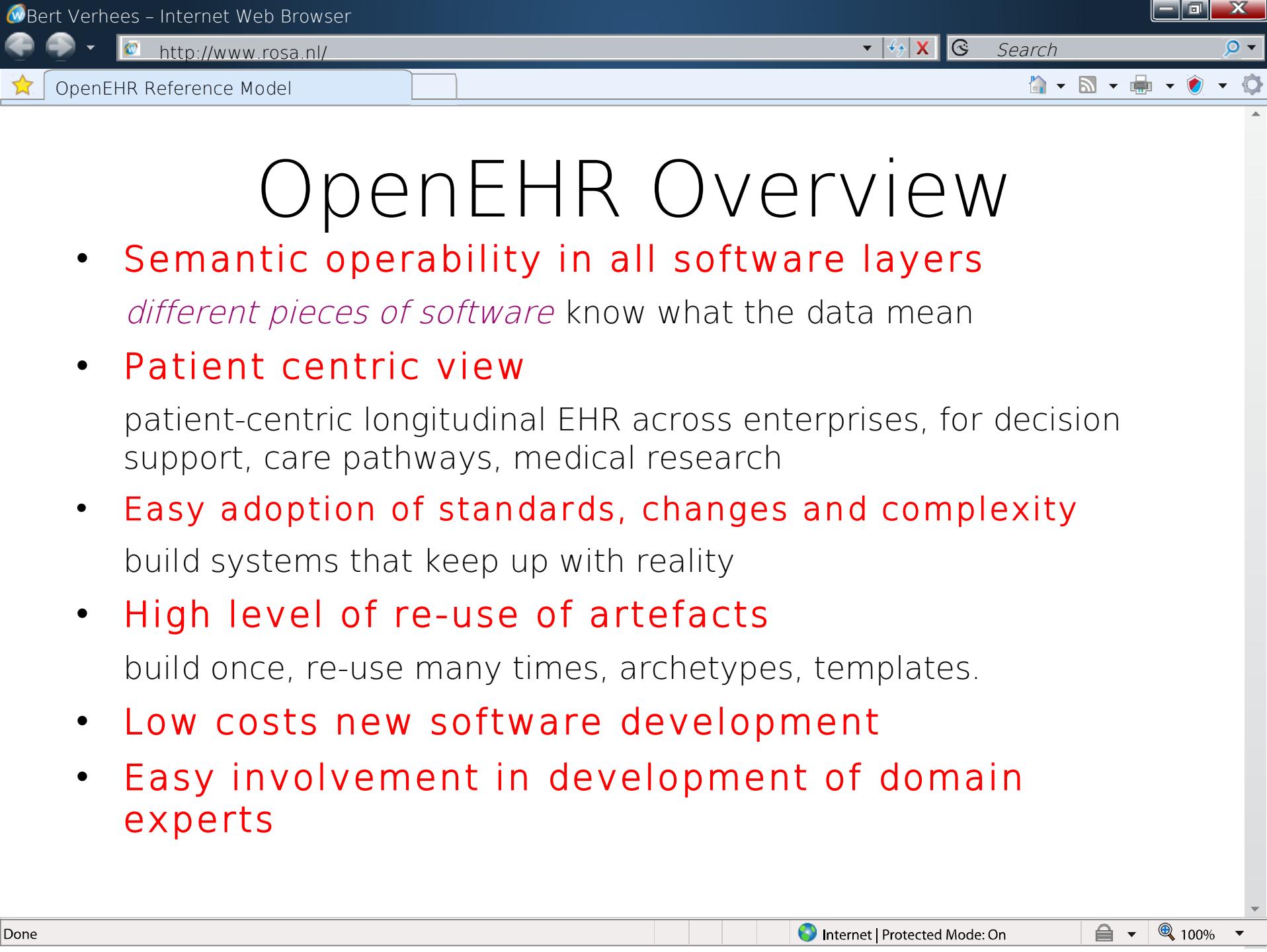


Done

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OpenEHR Overview

- Semantic operability in all software layers
different pieces of software know what the data mean
- Patient centric view
patient-centric longitudinal EHR across enterprises, for decision support, care pathways, medical research
- Easy adoption of standards, changes and complexity
build systems that keep up with reality
- High level of re-use of artefacts
build once, re-use many times, archetypes, templates.
- Low costs new software development
- Easy involvement in development of domain experts



Zorggemak

The company I work for (freelance-base) is "Zorggemak". One could translate it into "Easy Care".

Zorggemak works together with companies like Philips, and universities in Italy, Spain and Israel and others.

The projects involve (for Zorggemak) implementation of the OpenEHR kernel, archetypes and user-interfaces in/during surgery, in another projects, cardiac monitoring, and easy accessible data-collections and monitoring in home-care situations.



Zorggemak



The simplicity of the OpenEHR kernel API as implemented by Zorggemak and the simplicity of software-development.

- ✚ GUI-controls are mapped/identified by archetype/template-path-identifiers
- ✚ The kernel accepts path-identifiers and corresponding values as representation of RM-objects and validates against archetype before storing.
- ✚ Values are stored in a database-structure holding less than ten tables.
- ✚ Storage is optimized for use of AQL and easy RM-instance retrieval and collection.
- ✚ EN13606 authorization-schemes will be supported.
- ✚ Terminologies from OpenEHR internal, and SNOMED will be implemented