Medical Record Adapter based on openEHR

Biomedical Engineering (BME) and Data & Software Engineering (DSE) Research Divisions

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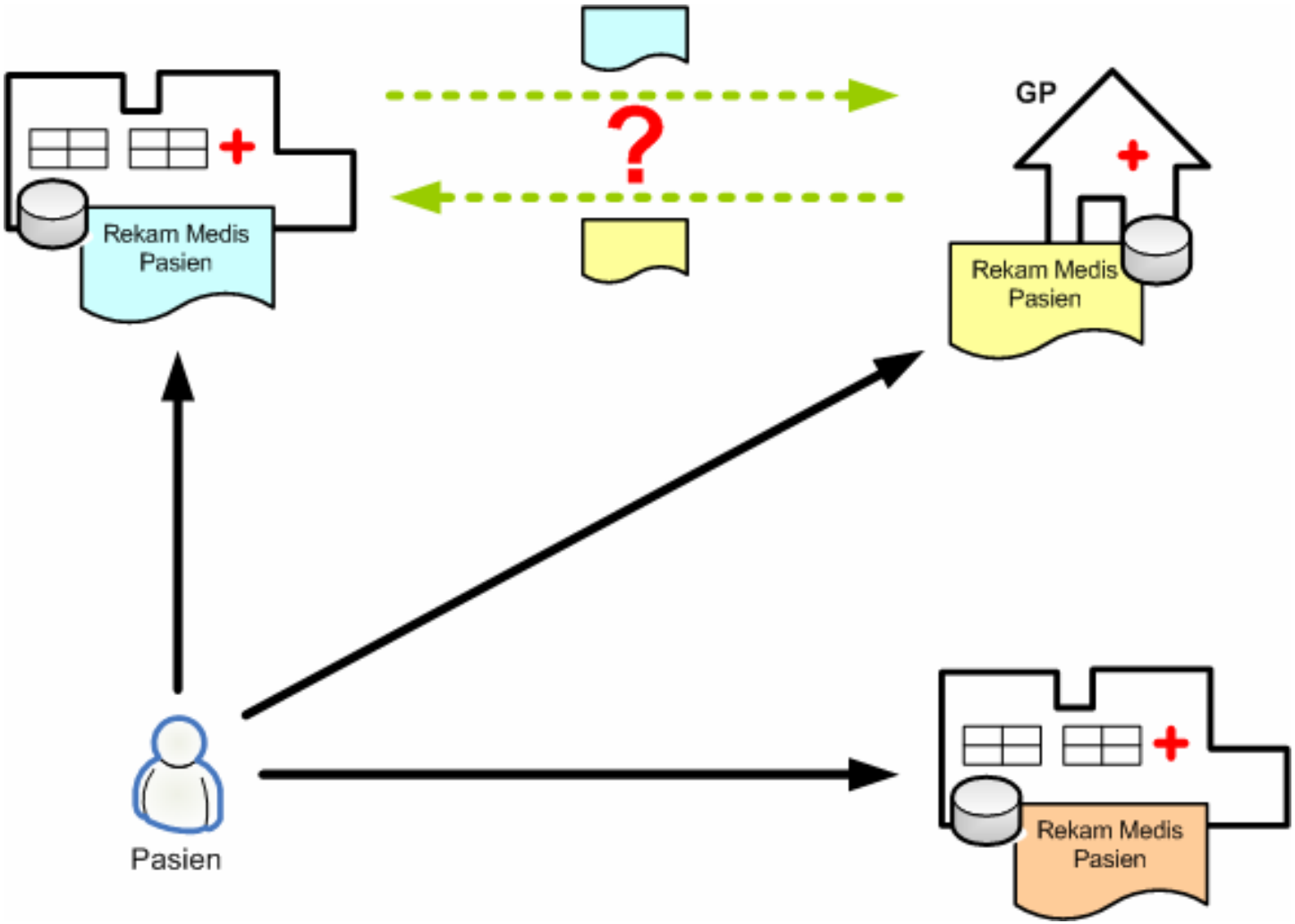
Motivation

“Lack of systemic support for an integrated, longitudinal (from birth to deceased) personal health record in currently available health system.”

Data Fragmentation

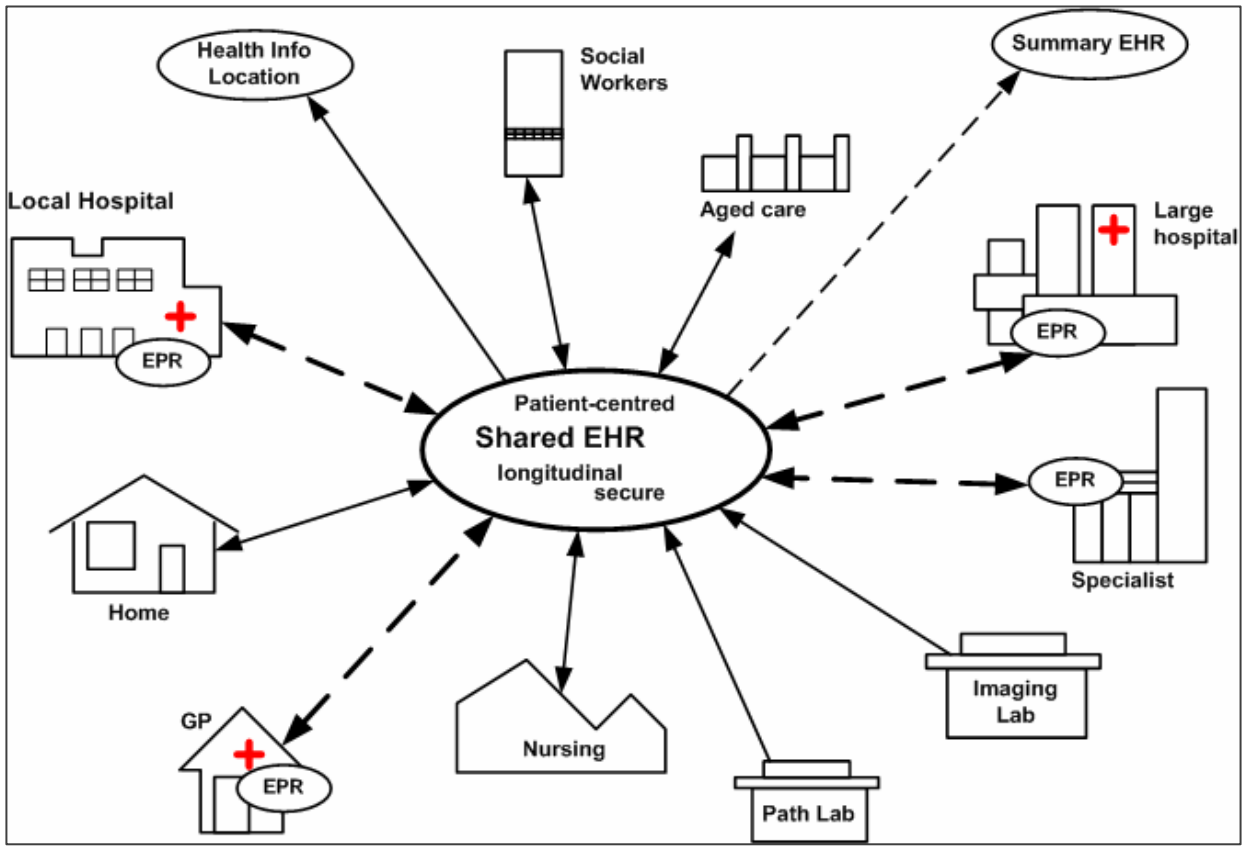


Health Record Standards

- Vast variability of current medical record standards:
  - Which to adopt?
    - European → CEN
    - U.S., Germany, Netherlands→ HL7
    - Indonesia: ?
  - How to manage the legacy records?

Vision

- Toward a longitudinal, secured, and sharable patient-centric Electronic Health Record (EHR).



openEHR: the Integrated Solution

- Aim
  - To manage fragmented electronic health records available in various different formats and integrate it under one generic, accessible, and interoperable platform.
- Open Source

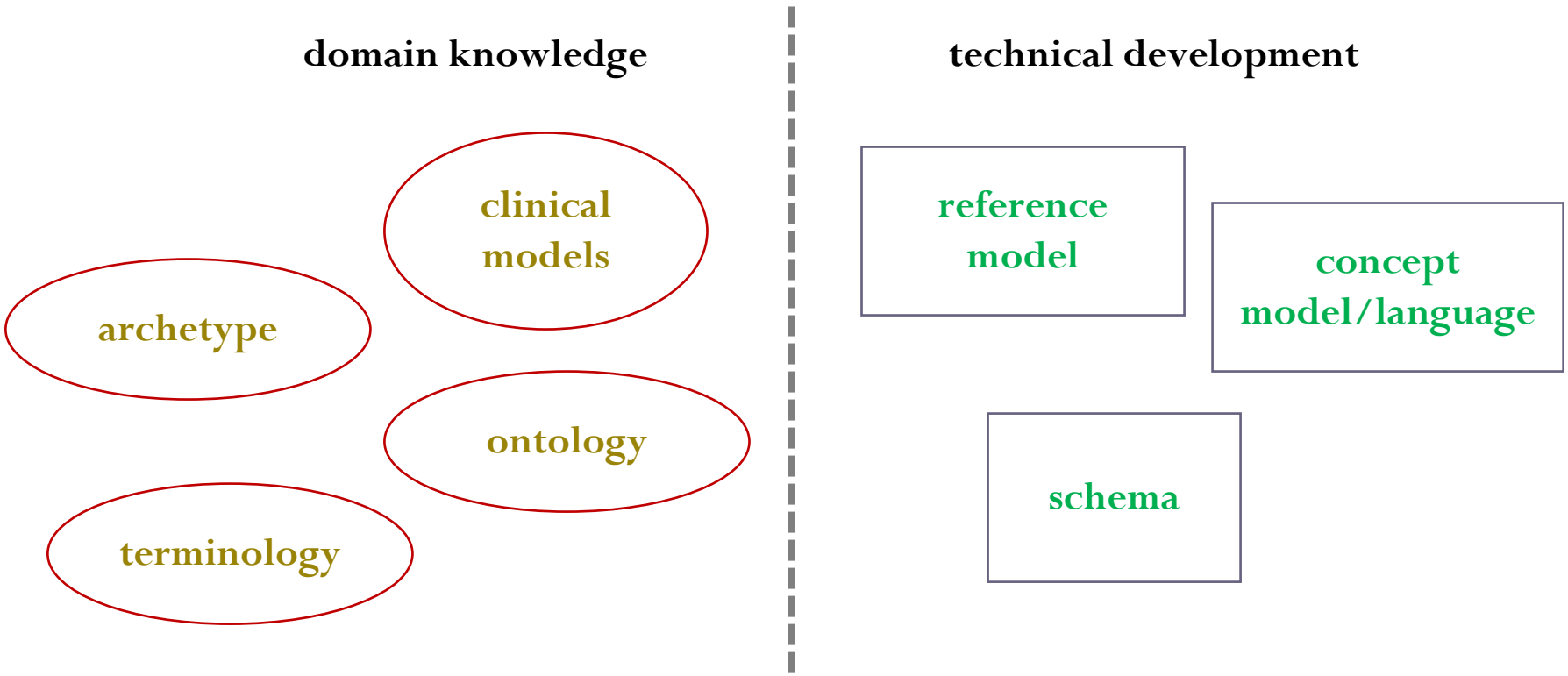
- Data exchange/communication protocol implementation:
  - Adopts the openEHR open medical record standard
  - Technically mediated by Data Center through shared archetype definition

openEHR Terms & Definitions

- openEHR
  - An open standard specification that describes the management and storage, retrieval and exchange of health data in electronic health records (EHRs).
- Archetype
  - A re-usable, formal model of a domain concept, used for providing specific definition and description of information/knowledge.

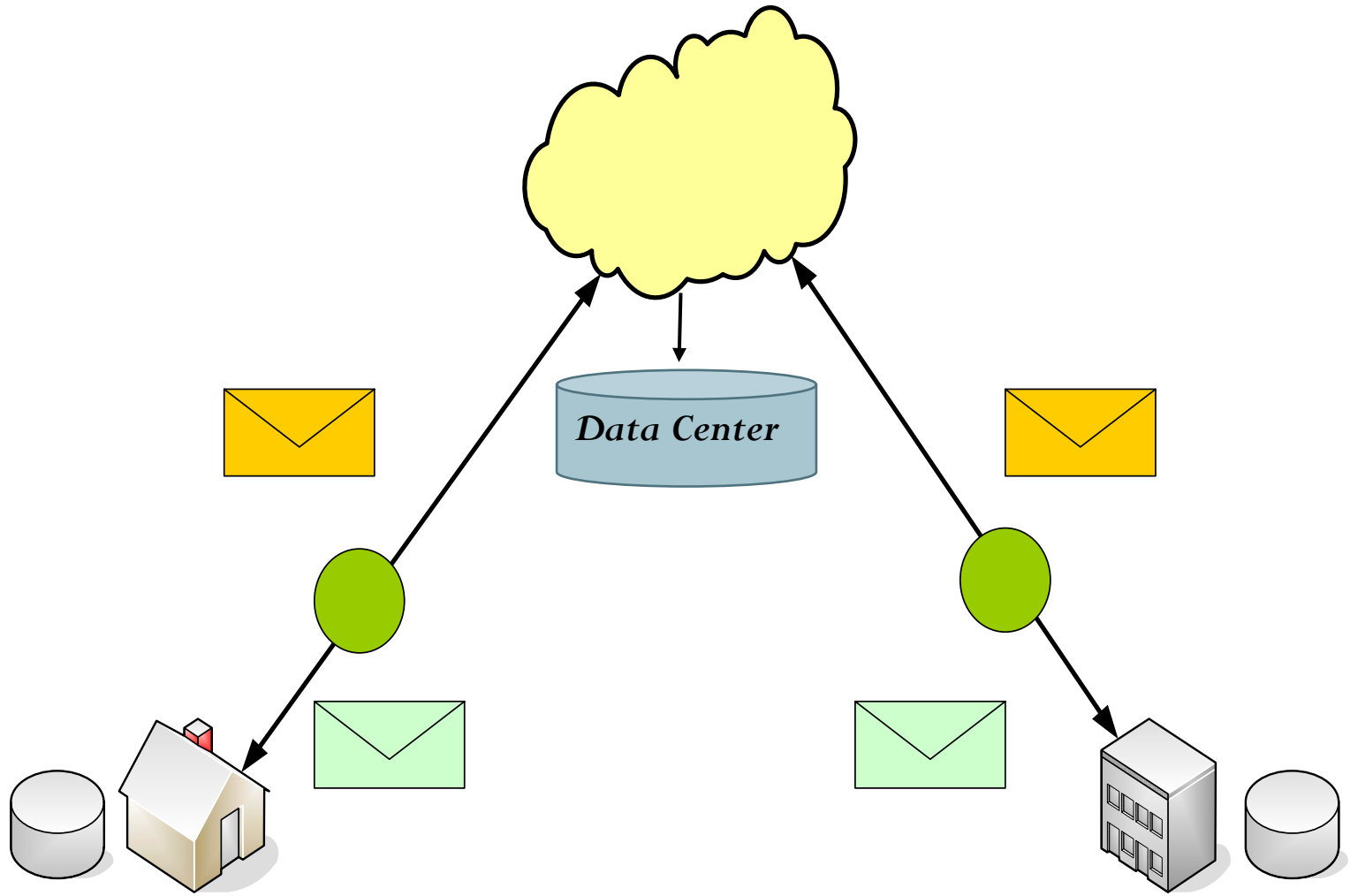
openEHR Information Modeling Paradigm

- Archetype approach separates technical development and medical knowledge domain



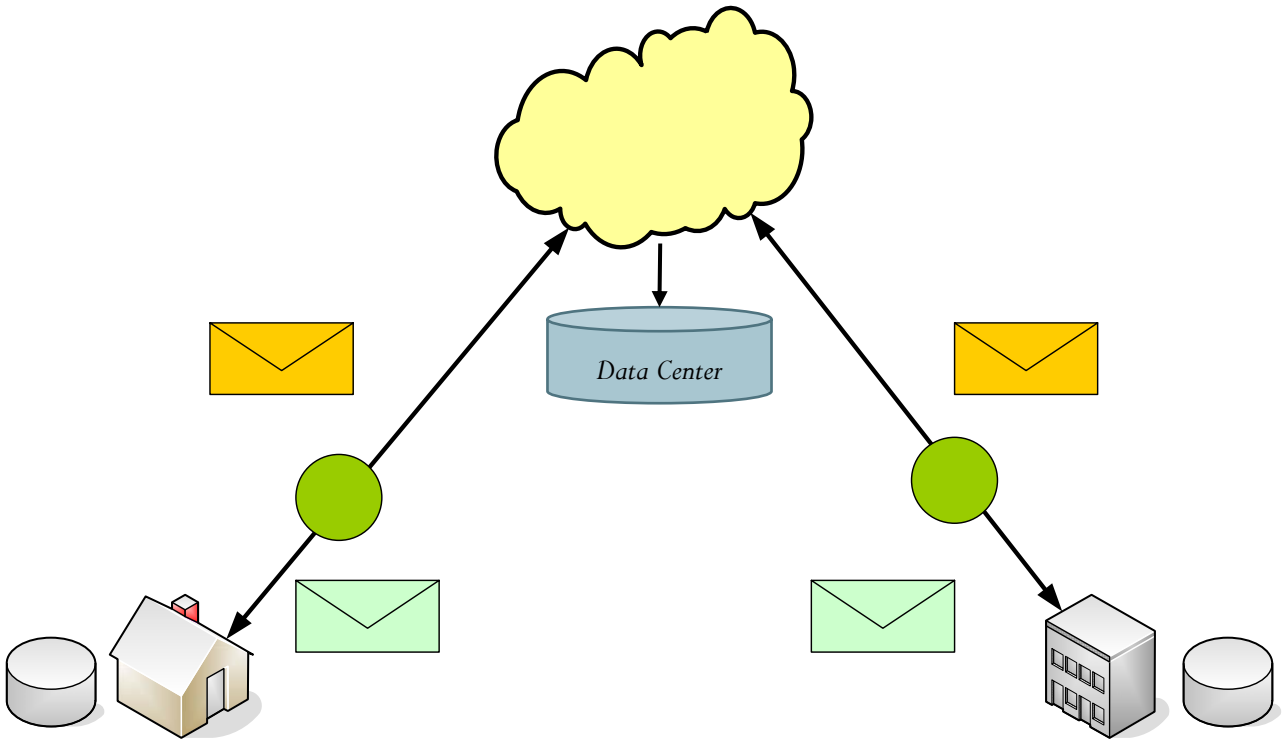
OpenEHR Data Exchange Architecture

- Data center-mediated Exchange



Open EHR Implementation Problem

- Telecommunication infrastructure problem for the technical implementation of Data Centers.



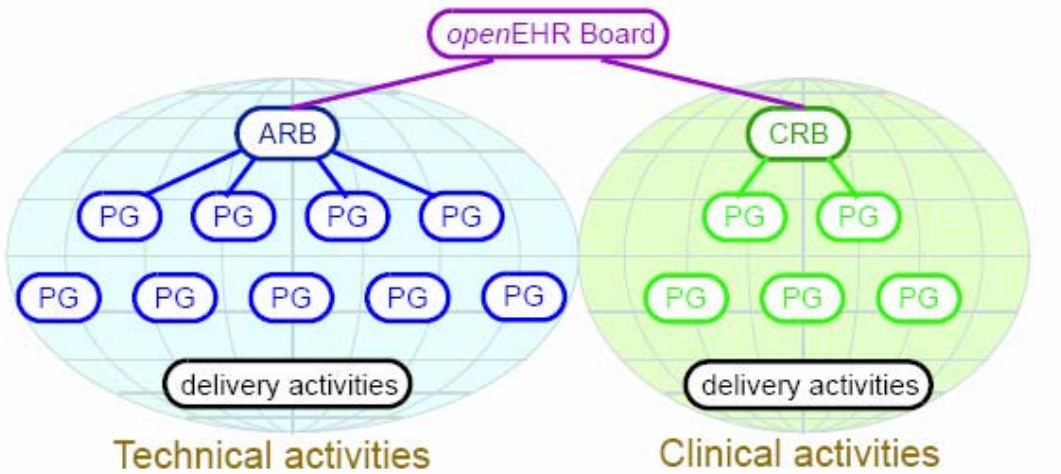
Advantages

- Ease of customization
  - High modularity
  - Simple interfacing: add library/panel
  - Adaptable to any kind of database architecture (*licensed/free*)

Demo...

What is OpenEHR

- An open, interoperable health computing platform, of which a major component is clinically effective and interoperable electronic health care records (EHRs)
- Founded by University College London, UK and Ocean Informatics Pty Ltd, Australia under the UK Companies Acts 1985 and 1989
- The major work of technical and clinical oversight and supervision of *open*EHR product developments is delegated to the Architectural Review Board (ARB) and Clinical Review Board (CRB)



The Aims of OpenEHR (1/2)

- Ability to record any **clinical information**, including complex time-based lab results, imaging, diagnoses, care plans, evaluations, patient education material, and stateful, workflowbased instructions and intervention information
- **Archetype- and template-enabling** of all clinical systems, empowering clinical professionals to define the content, semantics and user interfaces of systems independently from the software
- Proper **integration with terminology** systems, incuding with: SNOMED-CT so that reliable inferencing and decision support based on EHR data will be possible; LOINC, so that traceability and sharing of laboratory data is possible; and ICDx and ICPC classifications, enabling reliable reimbursement, management, and public health studies
- Ability to integrate *open*EHR with **messaging** systems, particularly HL7 version 2 and EDIFACT, via the use of "legacy archetypes" and systematic mapping definitions

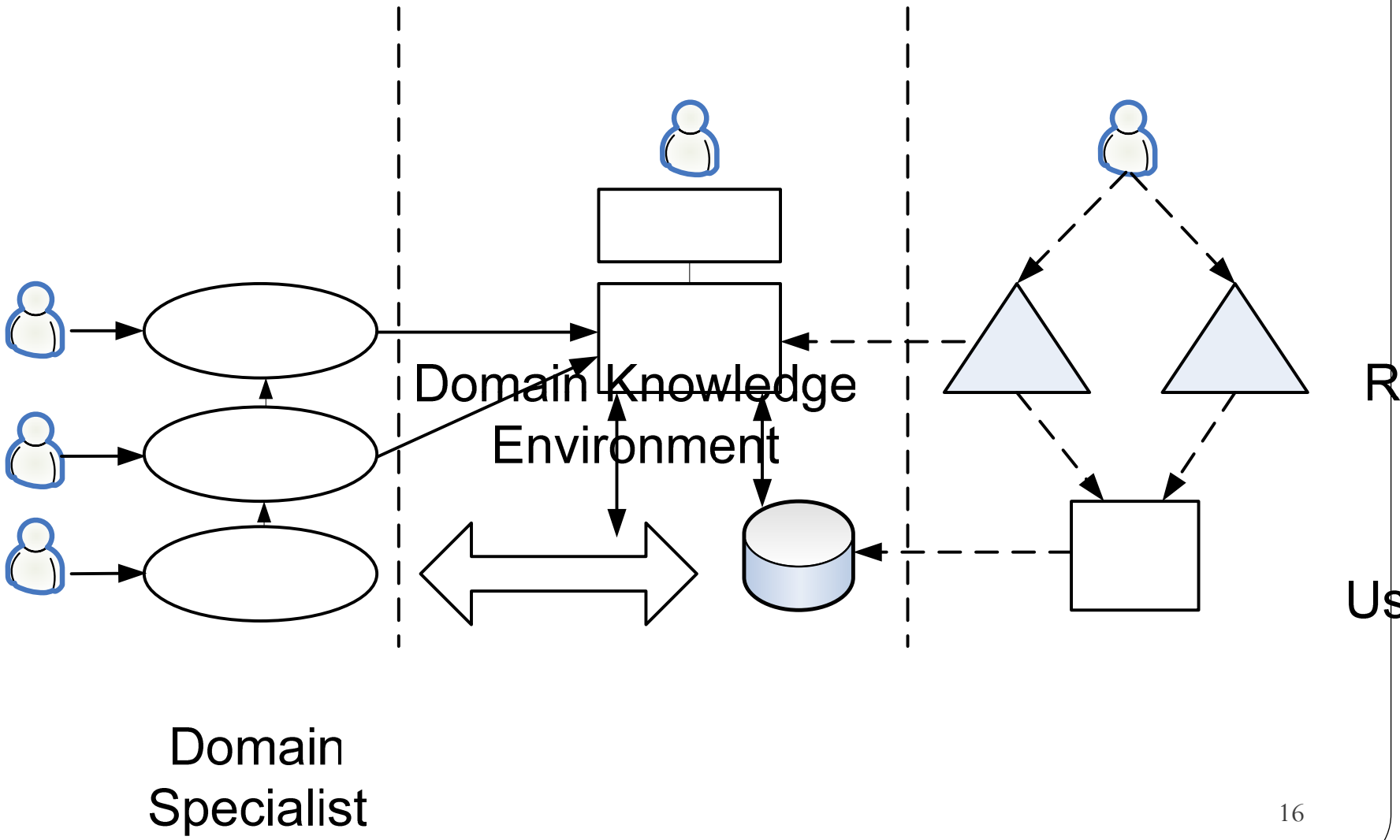
The Aims of OpenEHR (2/2)

- ability to integrate with existing **hospital information systems** and other databases, also via the use of legacy archetypes
- **integration with applications** via a published API
- to make the architecture **componentised, adaptive and future-proof**, so that it may be a reliable basis for managing 100 year+ health records

Note:

- LOINC = Logical Observation Identifiers Names and Codes: to facilitate the exchange and pooling of clinical results for clinical care, outcomes management, and research by providing a set of universal codes and names to identify laboratory and other clinical observations.
- SOMED-CT = Systematized Nomenclature of Medicine--Clinical Terms
- ICDx = nternational Statistical Classification of Diseases and Related Health Problems
- EDIFACT = Electronic Data Interchange For Administration, Commerce, and Transport

The openEHR Development Methodology



Medical Data Exchange