HANTSERINGEN AV OPENEHRS ARKITEKTURBIBLIOTEK HÅLLER PÅ ATT SYSTEMATISERA PÅ LIKANDE SÄTT. DETTA ARBETE KORDINERAS AV ’CLINICAL REVIEW BOARD’. ETT SAMARBEITSVÄRKTÖG TESTAS NU PÅ:

http://www.openneh.org/issues/browse/SPEC
DU BEHÖVER SKAPA ETT LOGIN-NAVY FÖRSTÅ GENN.

'http://www.openneh.org/knowledge/

FIG 1: “ARCHITECTURE OVERVIEW”

OPENEHR ENSAMHETENS OBJEKTÖR ER MED ENTALPEN, OBSERVERA OCH HANTSERINGEN. REGISTRERA OCH HANTSERINGEN FÖR ÄLMSTRAKSPENS.

ABRAKADABRA

NÄR MAN ANVÄNDER SAMMA GRUNDLÄGGANDE REFERENSMODELL (RM) UNDVISK RISIKABLA OMTOLKNINGAR. JOURNALANTECKNINGAR ÖVERFÖRS OFÖRÄNDRADE MELLAN SYSTENOMEN OCH KAN DIRECT LÅGAS/TOLKA AV MÄNNISKOR. VILL MAN DESULTOM AT DATORPROGRAMS TRÅGAR TULA! INNEHÅLLER PÅ SAMTIDIGT SÄTTE I DE OLIKA SYSTENOMEN KRÄVAS DET ATT MAN (UTÖVER RM) ANVÄNDER SAMMA ”ARKETYPER”.

KRAVANALYS

- EU-PROJEKT: GEHR (1989-94) → SYNAPSES MFL. (95-99) → OPENEHR
- ISO 1115, TS ISO/1D 18008,
  “REQUIREMENTS FOR AN ELECTRONIC HEALTH RECORD REFERENCE ARCHITECTURE”
- KONTINUERLIGT SYSTEMATISK KRÄVABE, ERFARENHET FRÅN FLESTA IMPLEMENTATIONER.

FEEDBACK, PROBLEM, UTÖKNINGAR, FÖRBÄTTRINGSFÖRESLAG M.M.
DISKUTERAS PÅ MAILINGLISTOR SAMT REGISTRERAS SYSTEMATISKT I ETT PUBLIT ÅRSMÖTE/HANTSERINGSSYSTEEM OCH HANTSERAS SLUTLAGEN AV "ARCHITECTURE REVIEW BOARD". DETTA LEGER TILL NYA UTSÄVOR AV SPECIFIKATIONERNA.

2004 - RELEASE 0.9
MAR 2005 - RELEASE 0.95
FEB 2006 - RELEASE 1.0
APR 2007 - RELEASE 1.0.1
DEC 2008? - RELEASE 1.0.2
4 EHR Package

4.1 Overview

The openEHR EHR is structured according to a relatively simple model. A central EHR object identified by an EHR id specifies references to a number of types of structured, versioned information, plus a list of Contribution objects that act as audits of change-sets made to the EHR. The high-level structure of the openEHR EHR is shown in Figure 3.

**FIGURE 3 High-level Structure of the openEHR EHR**

In this figure, the parts of the EHR are as follows:
- **EHR**: the root object, identified by a globally unique EHR identifier.
- **EHR access (versioned)**: an object containing access control settings for the record.
- **EHR status (versioned)**: an object containing various status and control information, optionally including the identifier of the subject (i.e. patient) currently associated with the record.
- **Directory (versioned)**: an optional hierarchical structure of Folders that can be used to logically organise Compositions;
- **Compositions (versioned)**: the containers of all clinical and administrative content of the record;
- **Contributions**: the change-set records for every change made to the health record; each Contribution references a set of one or more versions of any of the versioned items in the record that were committed or attested together by a user to an EHR system.
5.1 Overview
The Composition is the primary ‘data container’ in the openEHR EHR and is the root point of clinical content. Instances of the Composition class can be considered as self-standing data aggregations, or documents in a document-oriented system. The key information in a COMPOSITION is found in its content, context, and composer attributes. FIGURE 11 illustrates the composition package.

5.4.1 COMPOSITION Class

<table>
<thead>
<tr>
<th>CLASS</th>
<th>COMPOSITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
<td>One version in a VERSIONED COMPOSITION. A composition is considered the unit of modification of the record, the unit of transmission in record extracts, and the unit of attestation by authorising clinicians. In this latter sense, it may be considered equivalent to a signed document.</td>
</tr>
</tbody>
</table>

5.4.2 EVENT_CONTEXT Class

<table>
<thead>
<tr>
<th>CLASS</th>
<th>EVENT_CONTEXT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
<td>Documents the context information of a healthcare event involving the subject of care and the health system. The context information recorded here is independent of the attributes recorded in the version audit, which documents the “system interaction” context, i.e. the context of a user interacting with the health record system. Healthcare events include patient contacts, and any other business activity, such as pathology investigations which take place on behalf of the patient.</td>
</tr>
</tbody>
</table>

4.5 Time in the EHR

1. There are numerous times recorded in the EHR, at varying levels of granularity. Certain times are a by-product of the scientific investigation process, including times of sampling or collection of data. The following section gives an overview of how the EHR records these timestamps.

2. FIGURE 10 illustrates the relationship of times typical for a physical examination at a clinic. The top part of FIGURE 10 shows the relationship of times typical for a physical examination at a clinic. The bottom part of FIGURE 10 shows the relationship of times typical for a physical examination at a clinic. The times shown in FIGURE 10 are timelines that are specific to the context of the examination and can be represented in the EHR model on page 35, they also have (as shown with the contexts described in the reference model).

3. Other times to do with diagnoses (time of onset, time of resolution, time of last episode) and medications (time of administration, time of action, time of action, time of last medication) are specific to the action time and can be represented in the EHR model on page 35, they also have (as shown with the contexts described in the reference model).

FIGURE 10 Time in the EHR
FIGURE 18 Clinical Investigator Recording Process

SECTION

Represents a heading in a heading structure, or “section tree”.

ADMIN_ENTRY

Entry subtype for administrative information, i.e. information about setting up the clinical process, but not itself clinically relevant. Archetypes will define contained information.

EVALUATION

Entry type for evaluation statements.

Used for all kinds of statements which evaluate other information, such as interpretations of observations, diagnoses, differential diagnoses, hypotheses, risk assessments, goals and plans.

Should not be used for actionable statements such as medication orders - these are represented using the INSTRUCTION type.

FIGURE 28 rm.composition.content.entry Package

OBSESSION

Entry subtype for all clinical data in the past or present, i.e. which (by the time it is recorded) has already occurred. OBSERVATION data is expressed using the class HISTORY<>, which guarantees that it is situated in time.

OBSERVATION is used for all notionally objective (i.e. measured in some way) observations of phenomena, and patient-reported phenomena, e.g. pain.

Not used for recording opinion or future statements of any kind, including instructions, intentions, plans etc.

INSTRUCTION

Used to specify actions in the future. Enables simple and complex specifications to be expressed, including in a fully-computable workflow form.

Used for any actionable statement such as medication and therapeutic orders, monitoring, recall and review. Enough details must be provided for the specification to be directly executed by an actor, either human or machine.

Not to be used for plan items which are only specified in general terms.

ACTIVITY

Defines a single activity within an Instruction, such as a medication administration.

ACTION

Used to record a clinical action that has been performed, which may have been ad hoc, or due to the execution of an Activity in an Instruction workflow. Every Action corresponds to a careflow step of some kind or another.

INSTRUCTION_DETAILS

Model of a transition in the Instruction State machine, caused by a careflow step. The attributes document the careflow step as well as the ISM transition.
Multi-drug Therapy

A common regime for treating duodenal ulcer and related complaints is using Losec with other drugs, such as in the following combination:

- Losec 40 mg od x 4w or until no symptoms
- amoxicillin 500 mg 3tid x 14
- metronidazole 400 mg bid x 14

The instructions for this therapy is illustrated in FIGURE 32.

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**FIGURE 27** Periodic Series Instance Structure

**FIGURE 28** on data_structures/history Package

**FIGURE 30** Structure of HISTORY of INTERNAL EVENTS

**FIGURE 32** Multi-drug therapy Instruction

**FIGURE 23** Correspondence of Actions to Instructions

**FIGURE 24** openEHR standard Instruction State Machine

**FIGURE 19** The Clinical Investigator Recording (CIR) ontology
14.2 Integration Archetypes

The foundation of a key approach to the integration problem is the use of two kinds of archetypes. So far in this document "archetypes" has meant "designed" archetypes, generally clinical, demographic or administrative. The common factors for all such archetypes are:

- they are based on the main part of the reference model, particularly the Entry subtypes OBSERVATION, EVALUATION, INSTRUCTION and ACTION;
- they are consciously designed from scratch by groups of domain specialists, and integrated into the existing library of openEHR archetypes;
- there is one archetype per identifiable health "concept", such as an observation type, person type etc.

A second category of archetypes is "integration" archetypes. These are characterised as follows:

- they are based on the same high-level types (COMPOSITION, SECTION etc), but use the Entry subtype GENERIC_ENTRY (see EHR Information Model);
- they are designed to mimic the structure of legacy or existing data or messages; the design effort therefore is completely different, and is more likely to be done by IT or other technical staff who are familiar with the structures of the incoming data;
- there is one integration archetype per message type or identifiable source data that makes sense as a transaction to the EHR.

In the data integration environment, "designed" archetypes always define the target structures, coding and other semantics of data, while "integration" archetypes provide the means mapping external data into the openEHR environment.

14.3 Data Conversion Architecture

The integration archetype-based strategy for importing data into an openEHR system, shown in FIG URE 39, consists of two steps.

Figur 39 Data Integration using openEHR

Firstly, data are converted from their original syntactic format into openEHR COMPOSITION-SECTION-Generic Entry structures, shown in the openEHR integration switch. Most of the data will appear in the GENERIC_ENTRY part, controlled by an integration archetype designed to mimic the incoming structure (such as an HL7 v2 lab message) as closely as possible; FEEDER_AUDIT structures are used to contain meta-data of the result. The result of this step is data that are expressed in the openEHR type system (i.e. as instances of the openEHR reference model), and are immediately amenable to processing with normal openEHR software.

In the second step, semantic transformation is effected, by the use of mappings between integration and designed archetypes. Such mappings are created by archetype authors using tools. The key mapping rules are the key to defining structural transformations, use of terminological codes, and other changes. Serious challenges of course remain in the business of integrating heterogeneous systems; some of these are dealt with in the Common IM document sections on Feeder systems.

**NUMRINT**

**OM MAN HÅR LYCKAS BEVARA KÄLLSYSTEMETS URSPRUNGISLIGA SEMANTIK SÅ KAN MAN SÅ TILLBAKA TILL DUNDER BIBLIOVÄVEN. T. EX. OM ORIGINALSYSTEMET HAR ANVÄNDS...**

**SE KAPITEL 3.3.8 FRA SPECIFICATIONEN "COMMON IM", SIDORNA 15-18, SOM FINNS BIPOGÅDE I DETTA HäFTE.**

**OM MAN VID IMPORT FRÅN EXISTERANDE SYSTEM ANVÄNDER FEEDER_AUDIT I KOMBINATION MED "INTEGRATION ARCHETYPES" OCH LAGRA DET (SOM KOMMER IN I BIBLIOVÄVEN) SÅ ATT DET ÄR ATOMICLIGT VID EVENTUELLA SENSÖRE FÖRFRÅNAGSÅR SÅBHÖVER MAN BARA SKICKA MED EN LÄNK TILL ORIGINALDATA I I "EBR REPOSITORY".**