EHR Definition, Scope & Context

Sam Heard for
Peter Schloeffel
ISO/TC 215 WG1
Aarhus, Denmark 3 Oct 2003
Agenda

- Background to the project
- A taxonomy and definitions of the EHR
- Scope of the EHR
- Context of the EHR
- EHR systems
Project background, status & future

- Project initiated, Melbourne Aug 2002
- Discussion paper Oct 2002
- Working meeting, San Diego Feb 2003
- Joint WG session, Oslo May 2003
- 1st draft Technical Report, Jul 2003
- Working meeting, Sydney Jul 2003
- 2nd draft Technical Report, Sep 2003
- TR review, ISO WG meeting, Denmark Oct 2003
- 3rd (?final) draft Technical Report, Mar 2003
- TR review, ISO plenary meeting, May 2004
Purpose of the health record

◆ Primary (direct) purposes
  ◆ to benefit the patient through support of current and future healthcare needs

Any other purpose for which the EHR is used is considered secondary, as is any other beneficiary.

◆ Secondary (indirect/derived/supporting) purposes
  ◆ medico-legal, public & population health, quality management, education, research, policy development, health service management, billing etc.
a longitudinal collection of personal health information concerning a single individual, entered or accepted by healthcare providers, and stored electronically. The information is organised primarily to support continuing, efficient, and quality health care and is stored and transmitted securely. The EHR contains information which is:

1. **retrospective**: an historical view of health status and interventions;
2. **concurrent**: a “now” view of health status and active interventions; and
3. **prospective**: a future view of planned activities and interventions

*Draft ISO EHR Definition, Feb 2003*
Oslo meeting highlights

- Most of the 3 hour session spent discussing the definition
- Two main opinion groups on the definition
  1. Broadly accepted Feb 03 draft definition structure and content but much discussion about refinement of the definition
  2. Questioned the fundamental nature of the draft and generally advocated a much shorter and more generic definition
- Scope and context discussed only indirectly in relation to the definition
Inputs to definition post Oslo

- All Oslo meeting attendees invited to submit new draft definitions but five people targeted.
- Contributors were encouraged to ‘think outside the square’ and question both the structure and content of the draft definition.
- Eight draft definitions were received.
- These demonstrate a wide variety of approaches to defining the EHR and the difficulty of encompassing all of the many and varied facets of an EHR in a single definition.
Towards a new draft definition

- Several contributors stressed the importance of making a clear distinction between the content of the EHR and its form and structure.
- Others noted that technical definitions should wherever possible be precise and succinct.
- This is particularly true of ISO definitions which may be the subject of jurisdictional legal interpretation.
- It therefore seems prudent to propose a minimalist ‘core’ definition for the EHR and to elucidate the various functional, temporal, and content related aspects of the EHR through supplementary definitions and/or text.
A taxonomy of EHRs
Simple EHR taxonomy

- EHR
  - Shareable EHR
  - Non-shareable EHR
    - Integrated Care EHR
Requirements for interoperability

- Standardised Logical EHR Reference Model
  - Semantics of EHR management

- Standardised Service Models
  - Semantics of interface to EHR service

- Standardised Archetypes and Templates
  - Definitions of compound domain concepts

- Standardised Terminology
  - The language of health
Standards and the EHR

- What
- Clinical information

- About whom
- By whom
- When
- Currency
- Universal acceptor

Terminology

Standard Reference model

EHR Defn, Scope & Context, ISO, Aarhus Oct03
Standards and the EHR

- What
  - Read based on reference model
  - Standard queries expressed in terms of archetypes

Terminology

Service models

Shared Archetypes

Standard Reference model

EHR Defn, Scope & Context, ISO, Aarhus Oct03
EHR top-level definition

A repository of information regarding the health of a subject of care, in computer processable form.
Notes on the proposed definition

The proposed ISO top-level EHR definition:

- Makes no assumptions about the healthcare system of any country or region
- Makes no assumptions about the type or granularity of information in the record
- Is broadly applicable to all healthcare sectors, healthcare disciplines and methods of healthcare delivery
- “Subject of care” is synonymous with “patient” and “consumer”
- “Subject of care” may be more than one individual
Shareable EHR definition

- An EHR with a standardised information model which is independent of EHR systems and accessible by multiple authorised users and user applications.

- 3 additional attributes added to this defn:
  - A standardised information model – enables independence from EHR systems
  - Security of information both when stored and transmitted
  - An EHR accessible by multiple authorised users (and only by these authorised users)
Integrated Care EHR definition

◆ Short form:
  - A Shareable EHR whose primary purpose is the support of continuing, efficient and quality integrated healthcare. The ICEHR contains information which is retrospective, concurrent and prospective.

◆ Long form:
  - A repository of information regarding the health of a subject of care in computer processable form, stored and transmitted securely, and accessible by multiple authorised users. The ICEHR has a standardised information model which is independent of EHR systems. Its primary purpose is the support of continuing, efficient and quality integrated healthcare and it contains information which is retrospective, concurrent and prospective.
Other types of health records

- Electronic Medical Record (EMR)*
- Electronic Patient Record (EPR)*
- Computerized Patient Record (CPR)*
- Electronic Health Care Record (EHCR)*
- Virtual EHR*
- Personal Health Record (PHR)*
- Digital Medical Record (DMR)*
- Computerised Medical Record (CMR)
- Population Health Record

* Conform to proposed ISO EHR definition
The Personal Health Record

- Waegemann describes five types
- Widespread misapprehension that PHR must be different entity from the EHR if it is to meet the needs of patients/consumers
- PHR should have the same architecture as the SEHR and ICEHR to enable sharing of information between them, as and when appropriate, under the control of the consumer/patient
The Personal Health Record (2)

At least 4 different forms of PHR:

1. A self-contained EHR, maintained & controlled by the consumer/patient
2. Same as 1 but maintained by third party such as a web service provider
3. A component of a SEHR/ICEHR maintained by a healthcare provider (e.g. a GP) and controlled at least partially by the consumer/patient
4. Same as 3 but maintained and controlled completely by the patient/consumer
Scope of the EHR
Range of views on scope

- There are currently two broadly different views on the scope of the EHR:
  - The “Core EHR” (“Small EHR”)
  - The “Extended EHR” (“All EHR”)
The “Core EHR”

Key characteristics:
- Concerns a single subject of care
- Primary purpose is the support of present and future healthcare of the subject
- Principally concerned with clinical information
- Simplifies standardisation of the EHR
  - Has a clear, limited scope enabling a manageable set of requirements to be specified and a manageable standardised model to be defined
- Fits more closely with the distributed systems or “system-of-systems” paradigm
  - Allows more modular health information systems to be built
The “Extended EHR”

- Includes not only clinical information but essentially the whole “health information landscape”
- It is a superset of the Core EHR
- Extended EHR functions beyond the scope of the Core EHR include:
  - Patient administration
  - Scheduling and resource allocation
  - Billing
  - Decision support
  - Access control and policy management
  - Demographics
  - Order management
  - Terminology
  - Population health recording, querying, and analysis
  - Health professional recording, querying, and analysis
  - Business operations recording, querying, and analysis
‘Active Facilitator’ vs ‘Passive Repository’

- Active Facilitator EHR
  - Actively manages the healthcare delivery process
  - Incorporates real-time decision support and other functions such as workflow management, resource management, scheduling, costing etc

- Passive Repository EHR
  - Acts as the central data store and accepts multiple information feeds from front-end application systems
<table>
<thead>
<tr>
<th>Scope attribute</th>
<th>Core EHR</th>
<th>Extended EHR</th>
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</thead>
<tbody>
<tr>
<td>Focus</td>
<td>principally clinical information</td>
<td>the whole health information landscape</td>
</tr>
<tr>
<td>Relationship to each other</td>
<td>subset of Extended EHR</td>
<td>superset of Core EHR</td>
</tr>
<tr>
<td>Relationship to purposes of the EHR</td>
<td>principally concerned with primary purpose</td>
<td>concerned with both primary and secondary purposes</td>
</tr>
<tr>
<td>Relationship to ISO 18308 EHR requirements</td>
<td>defines the scope</td>
<td>many of the Extended EHR requirements beyond the scope of the 18308 EHR Reference Architecture</td>
</tr>
<tr>
<td>Modelling paradigm</td>
<td>small model which interfaces to many similar models for other services in a distributed systems environment</td>
<td>large model which defines the whole health information landscape</td>
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<tr>
<td>Approach for standardisation</td>
<td>separate standard for Core EHR and each other service in the health information landscape (layered approach)</td>
<td>single multi-part standard for all services</td>
</tr>
<tr>
<td>Active Facilitator EHR vs Passive Repository EHR</td>
<td>Passive Repository</td>
<td>Active Facilitator</td>
</tr>
<tr>
<td>Relationship to information and knowledge</td>
<td>contains only information</td>
<td>may contain information and knowledge</td>
</tr>
</tbody>
</table>
The EHR healthcare context
The EHR healthcare context

The content and granularity of an EHR may vary widely between different:

- Healthcare paradigms (Allopathic, Social, Chinese)
- Healthcare systems (funding and access models)
- Healthcare sectors (hospitals, GPs, rehab clinics)
- Healthcare settings (ED, office, OR, battlefield, home)
- Healthcare disciplines (doctor, nurse, social worker)
- Healthcare discipline within sector (nursing, physio, physician entries in an ICU EHR)
The temporal context

- What do we mean by “longitudinal”?
  - “involving information about an individual or group gathered over a prolonged period” – COD
- A 24 hour ICU admission?
- A single encounter in an ED?
- A road-side Good Samaritan act?
- ‘lifetime’, ‘before birth to after death’ – definitely yes
- The proposed EHR definitions and a single standardised Reference Information Model will cover both extremes
Context of the EHR in health information space
Distributed health information landscape

FIGURE 4 A Health Information Environment
EHR systems
The functional dimension of the EHR

- EHR functional requirements or functional specification relates to EHR systems, not to the EHR per se.

- **Function**: activity proper to anything, mode of action by which it fulfils its purpose” – **COD**

- **EHR system**: the set of components that form the mechanism by which electronic health records are created, stored, and retrieved. It includes people, data, rules and procedures, processing and storage devices, and communication and support facilities – **IOM**

- **EHR system**: a system for recording, retrieving, and manipulating information in electronic health records – **CEN ENV 13606-1, modified**
Types of EHR systems

- Local EHR systems
  - Systems architecture can be (needs to be) highly variable to meet the needs of different healthcare sectors and disciplines
    - (e.g. large hospital, family GP clinic, community nursing)

- Shared EHR systems
  - Two main systems architecture models:
    - the federated database model
    - the consolidated EHR model

- EHR Directory Service systems
  - Systems architecture can be essentially the same as for any distributed directory service system
A multi-layer Shared EHR strategy

- Wide-area access
- Patient-centred
- Care Delivery
- Meta-data items (EHR Index)

EPR
ICEHR
Shared-care
Longitudinal
secure
Patient-centred

Ad Hoc
ICEHR
Shared-care
Longitudinal
secure
Patient-centred

additional indexing?

Slide courtesy Thomas Beale
## EHR system characteristics

<table>
<thead>
<tr>
<th>EHR system type</th>
<th>Local-EHR system</th>
<th>Shared-EHR system</th>
<th>EHR Directory Service</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope and purpose</strong></td>
<td>Individual local healthcare providers</td>
<td>Local care communities Regional or national</td>
<td>National Trans-national</td>
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<tr>
<td><strong>Type of EHR</strong></td>
<td>Non-shareable EHR SEHR/ICEHR</td>
<td>SEHR/ICEHR</td>
<td>Index to SEHR or ICEHR</td>
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<td><strong>Type of data</strong></td>
<td>Detailed local data</td>
<td>Shared data</td>
<td>Meta-data index</td>
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<td><strong>Granularity of data</strong></td>
<td>Fine</td>
<td>Course (summary)</td>
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</tr>
<tr>
<td><strong>Contributors and access to EHR</strong></td>
<td>Local healthcare providers</td>
<td>Local care community or extended community (regional/national)</td>
<td>N/A**</td>
</tr>
<tr>
<td><strong>Custodian/maintainer</strong></td>
<td>Health Care Facility (Hospital, GP clinic etc)</td>
<td>Local health authority, HMO, GP custodian etc</td>
<td>Public health departments or similar</td>
</tr>
</tbody>
</table>
Thank you

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