

EHR STANDARDS

W. Ed Hammond, Ph.D.

President, AMIA

Vice-chair, HL7 Technical Steering Committee

Convenor, ISO TC 215 Working Group 2

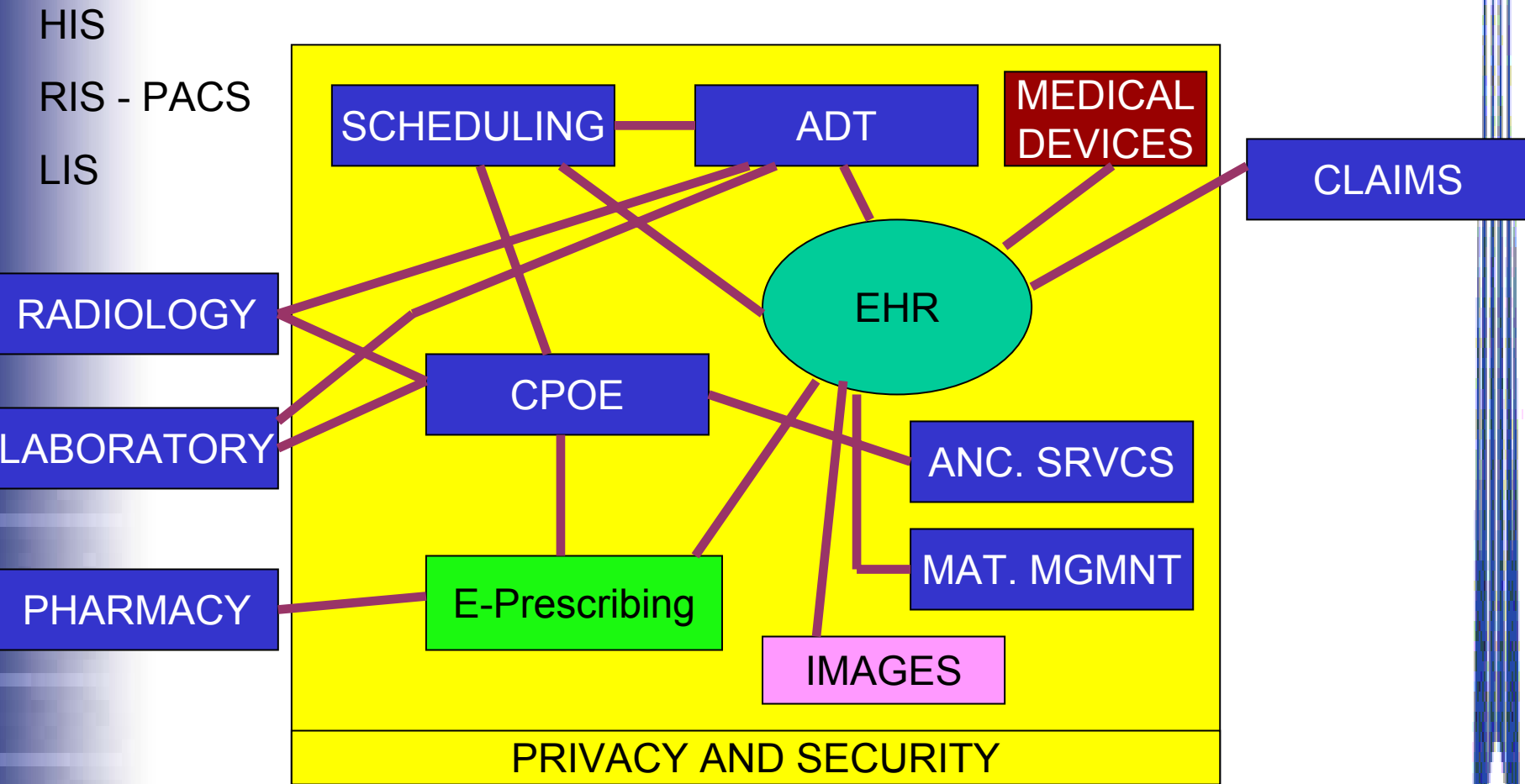
Adjoint Professor, Fuqua School of Business

Duke University

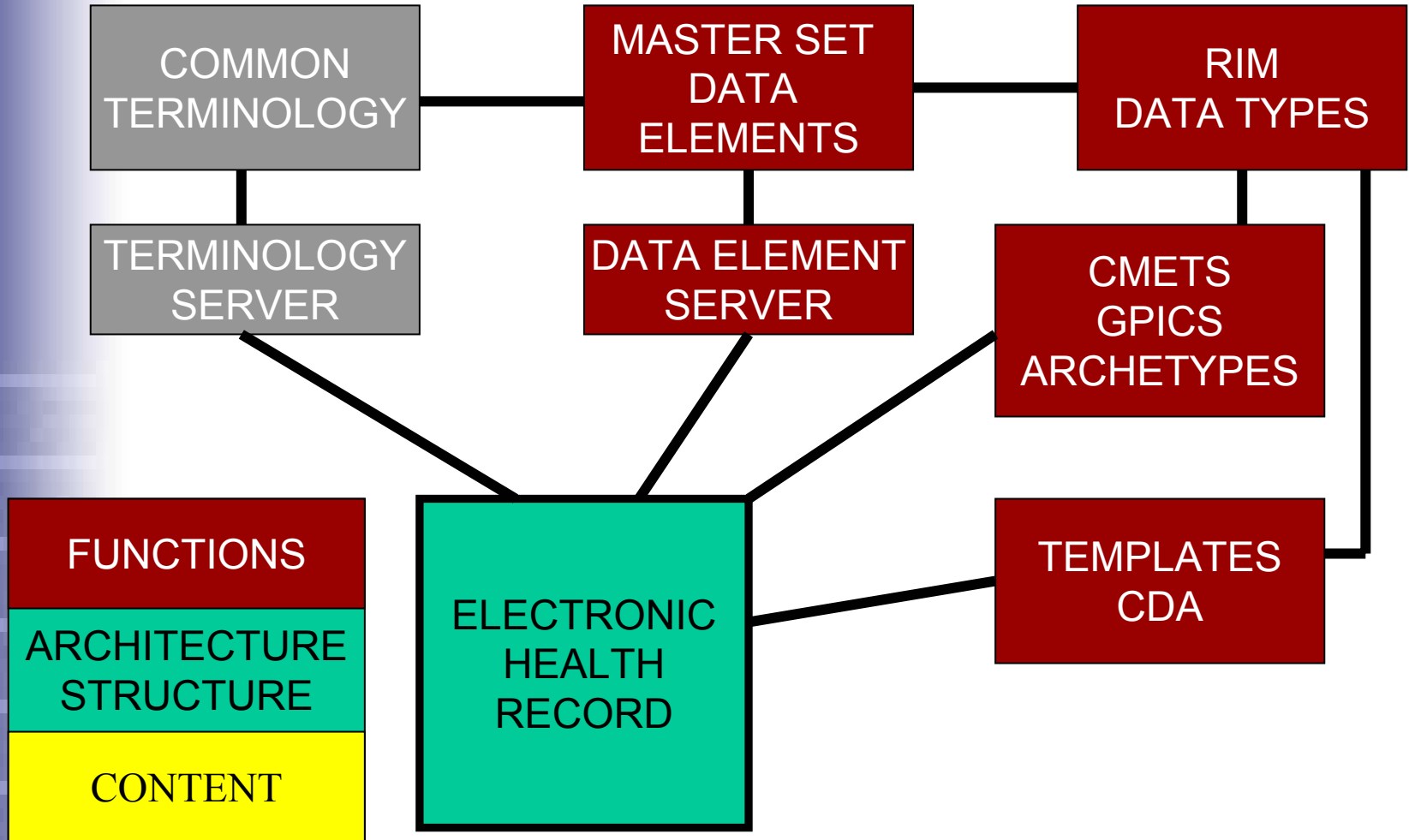
GROUPS OF STANDARDS

GENERIC, BROAD USE	XML, TCP/IP, SOAP, OCL, ETC. W3C, IETF, OMG, others
DATA ELEMENTS	RIM, DATA TYPES, TERMINOLOGY, CLINICAL TEMPLATES, CMETS, GPICS, ARCHETYPES, CDA
DATA INTERCHANGE	HL7 V2.N AND V3, DICOM, X73, CEN, X12 and others
KNOWLEDGE REPRESENTATION	ARDEN SYNTAX, GLIF, GEM, PRODILOGY, PROTIGÉ, vMR, GELLO, others
ELECTRONIC HEALTH RECORD	FUNCTIONAL, SUPER DATA SETS, TRANSFER, EHR MODEL
RELATED DATABASES APPLICATIONS	DISEASE REGISTRY, TOOL SETS, CONFORMANCE AND IMPLEMENTATION MANUALS

ELECTRONIC HEALTH RECORD SYSTEM



ELECTRONIC HEALTH RECORD



Terminology

- **NLM reaches agreement with SNOMED to make SNOMED available free in US**
- **VA signs \$4.7M contract with Apelon to create integrated reference terminology for VA**
- **LOINC accepted as terminology for laboratory tests**
- **RX Norm recommended as drug and drug-related terminology**
- **US debates switching to ICD-10**

- **What is International solution?**
- **What else must be done?**

U.S. EHR FUNCTIONAL STANDARDS PROJECT

- **Centers for Medicare and Medicaid (CMS) proposes an incentive plan to improve quality of care**
 - **Bonus payment to top 20% health care facilities base on quality indicators**
 - Top 10% = 2% bonus (Duke = ~ \$8M)
 - Next 10% = 1% bonus (Duke = ~ \$4M)
 - **Providers using EHR will be paid incentive bonus**
 - Have EHR system (requires defining & conformance testing)
 - Use EHR system (requires auditing)

Who defines EHR?

- **On July 1, 2003, HHS Secretary Tommy Thompson asked IOM and HL7 to produce functional standards for the EHR**
- **IOM would identify the required functions**
- **HL7 would create the standard, using a consensus process**
- **Time period was short: 3 months**

IOM Process

- **Used existing Patient Safety Data Standards Committee**
- **Organized definitions by site ...**
 - **Inpatient**
 - **Ambulatory/Outpatient**
 - **Nursing Homes**
 - **Personal Health Record**
- **And by time frame**
 - **Now: 2004-2005**
 - **2006-2007**
 - **2008-2010**

IOM CRITERIA

- **Improve patient safety**
- **Support delivery of effective patient care**
- **Facilitate management of chronic conditions**
- **Improve efficiency**
- **Feasibility of implementation by either vendor or provider**

IOM CORE FUNCTIONALITIES

- **Order Management**
- **Results Management**
- **Decision Support**
- **Electronic Communication**
- **Administration**
- **Data Requirements**
- **Reporting**
- **Patient Support**

1. Order management

- **CPOE**
 - eRX
 - Lab
 - Microbiology
 - Pathology
 - Xray
 - Ancillary
 - Nursing
 - Supplies
 - Consults

2. Results Management

- **Results reporting (4 categories)**
- **Multiple views of data/presentation**
- **Support multimedia**
 - **Images**
 - **Waveforms**
 - **Scanned forms/patient consents**
- **Pictures**
- **Sounds**

3. Decision Support

- **Access to knowledge sources**
- **Drug alerts**
- **Rule-based alerts**
- **Reminders**
- **Clinical guidelines & pathways**
- **Clinician work lists**
- **Incorporation of patient preference**
- **Diagnostic decision support**
- **Use of probabilistic data**
- **Automated real-time surveillance**

4. Electric Communication & Connectivity

- **Provider – provider**
- **Team coordination**
- **Patient – provider**
- **Medical devices**
- **Trading partners (outside institution)**
- **Integrated medical record (aggregation of data)**

5. Administrative

- **Scheduling management**
- **Eligibility determination**

6. Data requirements

- **Minimum data set**
- **Clinical narrative**
- **Patient acuity/severity of illness/risk adjustment**
- **Capture identifiers for people and roles, places, products and devices**
- **Eligibility determination**

7. Reporting

- **Patient safety and quality reporting public health reporting**
- **De-identifying data**
- **Disease registries**

8. Patient Support

- Patient Education
- Family education
- Patient-centered data

Core Functionalities – HL7

- **Direct Care Health Information**
- **Work Flow and Operations Management**
- **Communications**
- **Records Documents and Views**
- **Clinical Support**
- **Measurement, Analysis, Research, Reports**
- **Administration/Finance**

1. Direct Care Health Information

- **Data at point of care**
- **Care planning, critical paths, protocols**
- **Decision support**
- **Order management**
- **Results, results management, results entry**
- **Meds, meds management, prescribing**
- **Specimen collection & management**
- **Allergies/adverse events**
- **Special notes/ precautions**
- **Preventive care, wellness**
- **Consents & authorization**
- **Episodes, problem management**
- **Diet, diet management**

2. Work Flow & Operations Management

- **Work flow for health care delivery**
- **Scheduling**
- **Work lists**

3. Communications

- **Inter-practice**
- **Team coordination**
- **Provider/patient/ family**
- **Education patient, care giver, family**
- **Integrated medical record: I/P to O/P, cross settings**
- **Medical devices**
- **Outside places: radiology, laboratory, insurer, pharmacy**

4. Records, Documents and Views

- **Chart review**
- **Time line perspectives**
- **Historical snapshots**
- **Multimedia**
- **Wave forms**
- **Scanned documents**
- **Pictures**
- **Sounds**
- **Clinical document management**
- **Remote access**
- **Special record protection**
- **Multiple views of presentations**

5. Clinical Support

- **Epidemiological Surveillance**
- **Disease Registries**
- **Donor, blood bank**
- **Patient locator**
- **Practitioner locator**
- **Patient transport**
- **Bed management**
- **Demographics**

6. Measurement, Analysis, Research

- **Quality Indicators**
- **Performance and Accounting measurers**
- **Analysis and measurers**
- **Reports, reporting**
- **Clinical trials research**

7. Administration & Finance

- **Per patient encounter**
- **Eligibility, enrollment, authorization**
- **Practitioner/patient relationship**
- **Multiple person linkage**
- **Coding – diagnoses, procedures, outcomes**
- **Charges, charge management**
- **Costs, cost management**
- **Local authorization, localization**

The Ballot

- **221 persons actually voted – the largest number of people voting on an HL7 standard ever**
- **HL7 charged \$100 administrative fee for nonmembers to vote (negative reaction)**
- **Approximately 50.2% of the votes were negative. The largest number of negative votes came from the vender community.**

Ballot Results

0	# votes	YES	NO	ABST	NONE
Vendor	92	21	58	7	6
Provider	78	25	42	2	9
General	37	20	7	6	4
Consultant	28	15	9	0	9
Affiliate	11	1	8	0	2
Pharmacy	1	0	0	0	1
TOTAL	247	82	124	15	1
Percent		33.2%	50.2%	6.07%	10.53%

Feedback from voting

- **Structure vs functional description**
- **Vague and ambiguous terms and concepts**
- **Wanted clear and explicit definitions**
- **Variations in granularity**
- **Free text vs templates**
- **Clinical vs infrastructure terms**
- **Want specific data elements to be defined**
- **Confusion on Essential/Desired Tags**

- **Next round, categories will be Essential/Now; Essential/Future; Optional; Not Applicable**

Feedback

- **HL7 used Essential to indicate items included now; equivalent to the 1st IOM time line.**
- **HL7 used Desirable to indicate items required later; equivalent of the IOM 2nd and 3rd time lines**
- **Much confusion and negative comments resulted from the use of those terms.**

Future EHR Standard Activities

- **Create super set of data elements – incorporating data element name, definition, data type, code set when appropriate, units**
- **Standards (process or implementation or conformance manual) to transfer EHR from one site to another. Build on:**
 - **GP2GP**
 - **openEHR**
 - **CEN 13606**
 - **CDA, clinical templates, CDA**

The Future

- **Continued growth**
 - **Patient Safety**
 - **Pediatric Data Standards**
 - **Pacemakers**
 - **Disease Registries**
 - **Clinical Involvement**